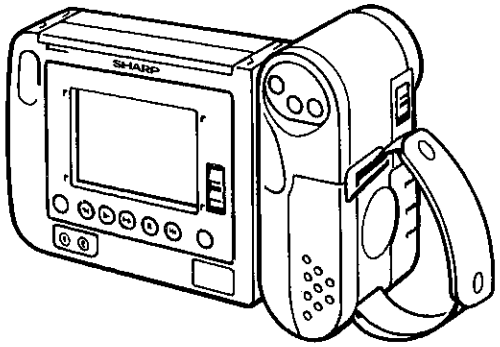
SHARP SERVICE MANUAL

S63X9VL-E30U/



LIQUID CRYSTAL CAMCORDER 8 NTSC

MODELS VL-E30U/C VL-E35U/E35

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified be used.

The mechanism of this model is discussed in the VL-N1U/C Service Manual. Refer to the **MECHANISM SECTION DESCRIPTION** in the manual.

CONTENTS

	Page
1. IMPORTANT SERVICE NOTES	1—1
2. FEATURES	2—1
3. SPECIFICATIONS	2—1
4. PART NAMES AND FUNCTIONS	4—1
5. DISASSEMBLY AND REASSEMBLY	5—1
6. ADJUSTMENT OF VCR SECTION	6—1
7. ADJUSTMENT OF CAMERA SECTION	7—1
8. TROUBLESHOOTING	8—1
9. BLOCK DIAGRAMS	9—1
10. SCHEMATIC DIAGRAMS	10—1
11. SEMICONDUCTOR LEAD IDENTIFICATION	11—1
12. PRINTED CIRCUIT BOARDS	12—1
13. FUNCTION TABLE OF IC	13—1
14. REPLACEMENT PARTS LIST	14—1
15. PACKING OF THE SET	15—1
16. AC ADAPTER	16—1

SHARP ELECTRONICS CORPORATION

Service Headquarters: Sharp Plaza, Mahwah, New Jersey 07430-2135 Phone (201)512-0055

SHARP ELECTRONICS OF CANADA LTD.

335 Britannia Road East Mississauga, Ontario L4Z 1W9 Canada Phone; (416) 890-2100

1. IMPORTANT SERVICE NOTES

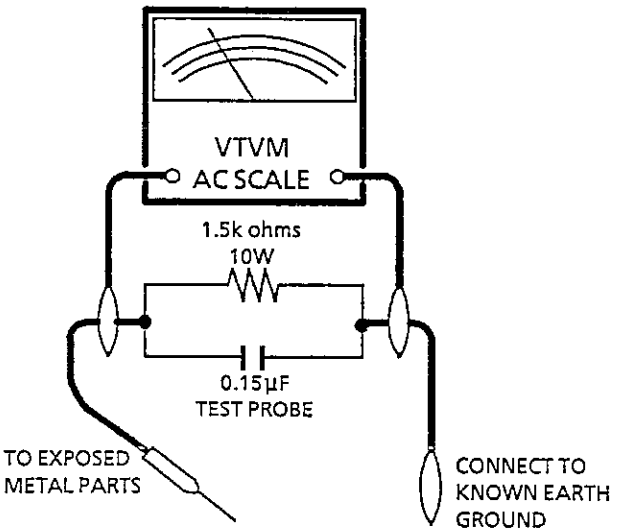
BEFORE RETURNING THE VIDEO CAMERA RECORDER

Before returning the video camera recorder to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the video camera recorder.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor/capacitor networks, mechanical insulators etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC line cord directly into a 120 volt AC outlet (Do not use an isolation transformer for this test).
- Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known ground, such as a water pipe or conduit.
- Use a VTVM or VOM with 1000 ohm per volt, or higher sensitivity or measure the AC voltage drop across the resistor (See Diagram).
- Move the resistor connection to all exposed metal parts having a return path to the chassis (antenna connections, metal cabinet, screw heads, knobs and control shafts, etc.)

he AC voltage drop across the resistor. verse the AC plug (a non polarized adaptor plug must be used but only for the purpose of completing these checks) on the set and repeat the AC voltage measurements for each exposed metallic part. Any reading of 0.45V rms (this corresponds to 0.3mA rms AC.) or more is excessive and indicates a potential shock hazard which must be corrected before returning the video camera recorder to the user.



1. NOTES DE SERVICE IMPORTANTES

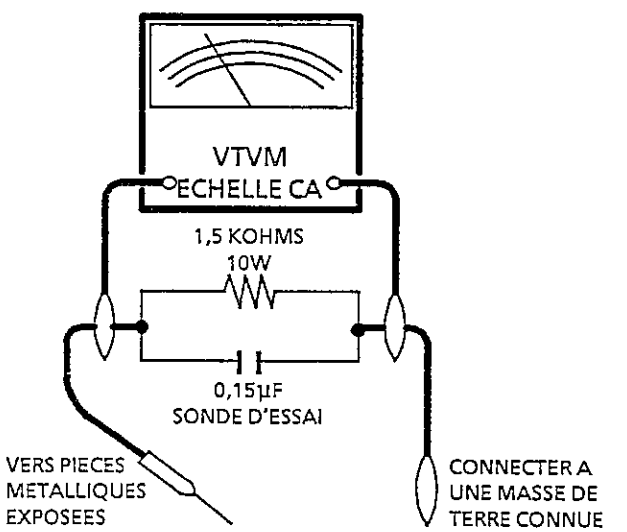
AVANT DE RENDRE LE MAGNETOSCOPE

Avant de rendre le magnétoscope à l'utilisateur, effectuer les vérifications de sécurité suivantes.

1. Vérifier toutes les gaines de fil pour être sûr que les fils ne sont pas pincés ou que le matériel n'est pas coincé entre le châssis et les autres pièces métalliques dans le magnétoscope.
2. Vérifier tous les dispositifs de protection tels que les boutons de commande non métalliques, les matériaux d'isolement, le dos du coffret, les couvercles de compartiment et ajustement ou les boucliers, les réseaux de résistance / condensateur d'isolement, les isolateurs mécaniques, etc.
3. Pour être sûr qu'il n'y a aucun risque de choc électrique, vérifier le courant de fuite de la manière suivante.

- Brancher le cordon d'alimentation secteur directement dans une prise de courant de 120 volts. (Ne pas utiliser de transformateur d'isolement pour cet essai).
- Utiliser deux fils à pinces et connecter une résistance de 10 watts 1,5 kohm en parallèle avec un condensateur de 0,15 µF en série avec des pièces du coffret métallique exposées et une masse de terre connue telle qu'un tuyau ou un conduit d'eau.
- Utiliser un VTVM ou VOM avec une sensibilité de 1000 ohms par volt ou plus ou mesurer la chute de tension CA entre la résistance (voir diagramme).
- Déposer la connexion de la résistance à toutes les pièces métalliques exposées ayant un parcours de retour au châssis (connexions d'antenne, coffret métallique, têtes

de vis, boutons et arbres de commande, etc.) et mesurer la chute de tension CA entre la résistance. Inverser la fiche CA (une fiche intermédiaire non polarisée doit être utilisée à seule fin de faire ces vérifications.) sur l'appareil et répéter les mesures de tension CA pour chaque pièce métallique exposée. Toute lecture de 0,45 Vrms (ceci correspond à 0,3 mArms CA) ou plus est excessive et signale un danger de choc qui doit être corrigé avant de rendre le magnétoscope à son utilisateur.



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO WET LOCATIONS.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

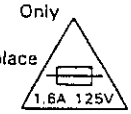
This symbol warns the user of uninsulated voltage within the unit that can cause dangerous electric shocks.

This symbol alerts the user that there are important operating and maintenance instructions in the literature accompanying this unit.

CAUTION

Camcorder Only

This symbol mark means following.
For continued protection against fire hazard replace only with same type fuse.



BATTERY DISPOSAL

CONTAINS SEALED LEAD BATTERY. MUST BE RECYCLED OR DISPOSED OF PROPERLY.
REMOVE THE BATTERY FROM THE PRODUCT AND CONTACT FEDERAL OR STATE ENVIRONMENTAL AGENCIES FOR INFORMATION ON RECYCLING AND DISPOSAL OPTIONS.

ATTENTION: POUR REDUIRE LES RESQUES D'INCENDIE OU DE CHOC ELECTRIQUE, NE PAS EXPOSER CET APPAREIL A LA PLUIE OU A L'HUMIDITE.

ATTENTION
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

ATTENTION: AFIN DE REDUIRE LES RISQUES DE CHOC ELECTRIQUE, NE PAS RETIRER LE COUVERCLE, AUCUN ORGANE INTERNE NE PEUT ETRE REPARE PAR L'UTILISATEUR. CONFIER L'APPAREIL A UN DEPANNEUR QUALIFIE.

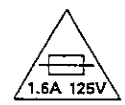
Ce symbole signale à l'utilisateur la présence d'une tension non isolée à l'intérieur de l'appareil qui peut être la cause de secousses électriques dangereuses.

Ce symbole avertit l'utilisateur que des instructions importantes relatives à l'utilisation et àl'entretien se trouvent dans le manuel accompagnant l'appareil.

PRECAUTION:

Camcorder Seulement

Cette marque indique comme suit. Pour la protection continue contre le risque d'incendie, ne remplacer que par le fusible de même type.



MISE À LA DÈCHARGE DE LA BATTERIE

CONTIENT UNE BATTERIE PLOMBÉE. DOIT ÈTRE RECYCLÉE OU MISE À LA DÈCHARGE DE MANIÈRE SÛRE.
ENLEVER LA BATTERIE DE L'APPAREIL ET CONTACTER LES AGENCES FÈDÈRALES OU NATIONALES DE PROTECTION DE L'ENVIRONNEMENT POUR OBTENIR DES INFORMATIONS SUR LE RECYCLAGE ET LES POSSIBILITÈS DE MISE À LA DÈCHARGE.

2. FEATURES

1. VARIABLE-ANGLE SHOOTING AND INSTANT REPLAY WITH 3" COLOR LCD MONITOR AND BUILT-IN SPEAKER
2. SCENE MENU FOR 4 SHOOTING SITUATIONS — SPORT, SNOW·SAND, TWILIGHT, AND PARTY
3. Hi-Fi MONAURAL
4. NEURO AUTO EXPOSURE
5. DIGITAL AUTO WHITE BALANCE
6. DIGITAL FULL RANGE AUTO FOCUS
7. ON SCREEN MENU DISPLAY
8. 16:9 WIDE SCREEN COMPATIBILITY
9. INFRARED REMOTE CONTROL
10. 8× POWER ZOOM
11. EDIT SEARCH
12. INDEX SEARCH (QUICK RETURN)
13. FLYING ERASE HEAD FOR EDITING
14. AUTO HEAD CLEANER
15. WARNING INDICATORS — LOW BATTERY, LOW LIGHT, TAPE END, ETC.
16. 3-WAY POWER SOURCE: AC, RECHARGEABLE BATTERY, AND CAR BATTERY (with optional VR-U100CH)

3. SPECIFICATIONS

Signal System:	NTSC standard
Recording System:	2 rotary heads, helical scanning system
Cassette:	8mm video tape, MP type
Recording/Playback Time:	120 minutes (P6-120)
Tape Speed:	14.345mm/second
Pickup Device:	1/4" CCD image sensor (with approx. 270,000 pixels including optical black)
Lens:	8× power zoom lens (F1.8, f=4.5-36mm), and full-range auto focus
Lens Filter Diameter:	37mm
Monitor:	3" full-color LCD screen (TFT active matrix)
Microphone:	Electret monaural microphone
Color Temperature Compensation:	Auto white balance
Minimum Illumination:	5 lux*
Video Output Level:	1.0Vp-p 75-ohm unbalanced
Audio Output Level:	−8 dBs, impedance less than 2.2 kohms
Speaker Output:	150 mW
External Microphone Input:	3.5 mm diameter mini-plug, −66 dBs, input impedance 6.8 kohms, DC 2.5-4 V, low-impedance microphone use
Power Requirement:	DC 6.0 V
Power Consumption:	7.9 W (during camera recording in Auto mode with zoom motor off, backlight in normal mode)
Operating temperature:	0°C to +40°C (32°F to 104°F)
Operating humidity:	35% to 80%
Storage temperature:	−20°C to +60°C (−4°F to 140°F)
Dimensions (approx.):	7⅞"(W)×4⅞"(H)×2¹⁵⁄₁₆" (D) [200mm(W)×123.5mm(H)×75mm(D)]
Weight (approx.):	1.87 lbs (850 g)

AC Adaptor/Battery Charger (UADP-0156GEZZ)

Power Requirement:	AC 110-240 V, 50/60 Hz
DC Output:	6.0 V
Power Consumption:	23 W
Dimensions (approx.):	**2 11/16" (W) × 1 11/16" (H) × 6 7/16" (D) [70.0 (W) × 43.5 (H) × 163.5 (D) mm]**
Weight (approx.):	0.77 lbs (350 g)

Battery Pack BT-77U

DC Output:	6.0 V
Dimensions:	1⅞"(W)×1¹³⁄₃₂"(H)×3¹⁷⁄₃₂"(D) [46mm(W)×21mm(H)×89.5mm(D)]
Weight:	0.35 lbs (158 g)

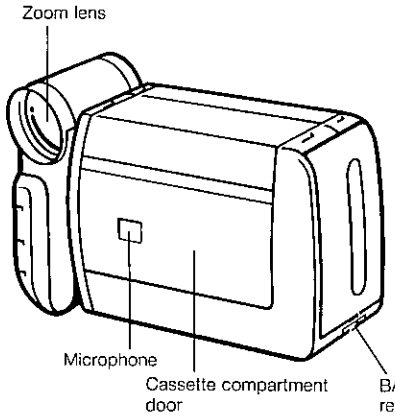
Specifications are subject to change without notice.

*Minimum illumination: Since there is no widely accepted testing procedure for determining minimum illumination capability, lux ratings are comparable only between models from the same manufacturer.

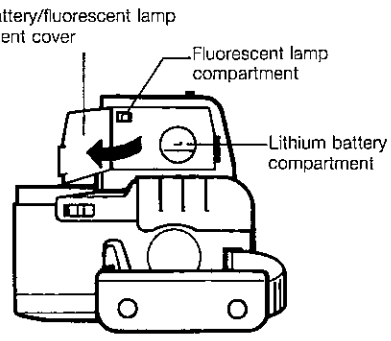
PART NAMES

For details on the use of each control, refer to the page number indicated in the brackets.

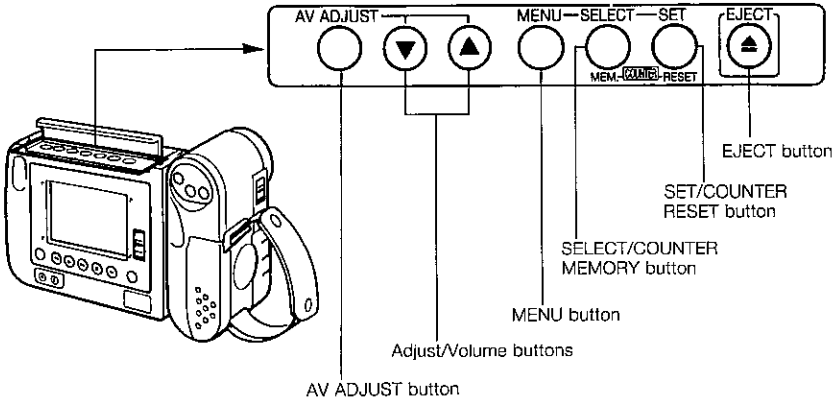
FRONT VIEW



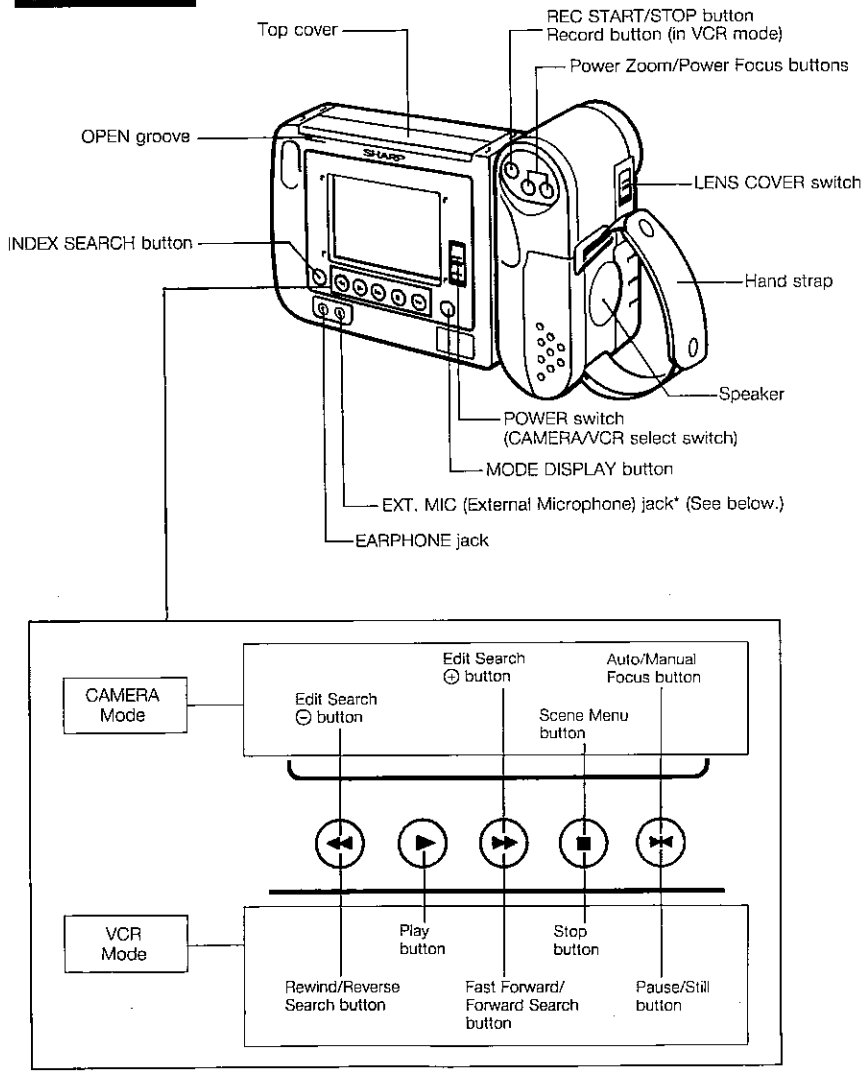
When camera module is rotated



TOP VIEW



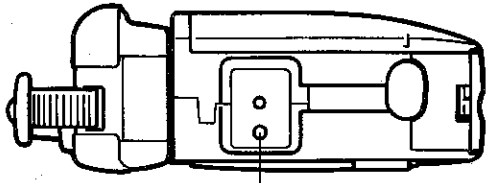
REAR VIEW



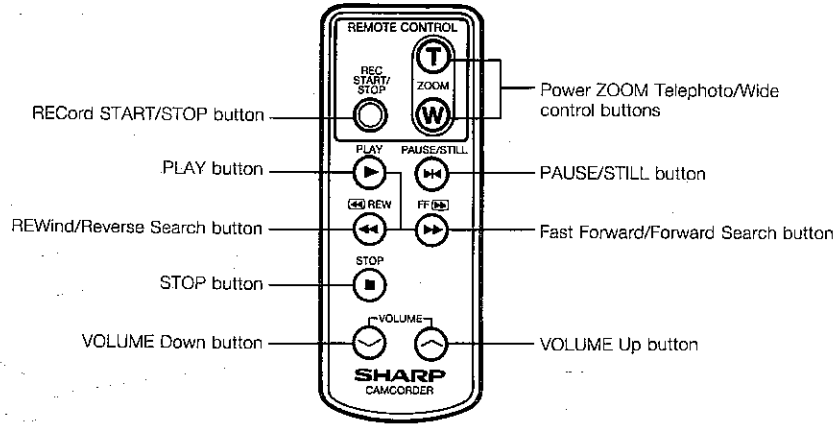
***About the EXT. MIC (Plug-in Power) Jack**

This microphone jack outputs a DC voltage of 4.0 V. It is exclusively for use with the VIEWCAM's optional accessories. Do not use the jack for anything else. Otherwise, the connected microphone may be damaged.

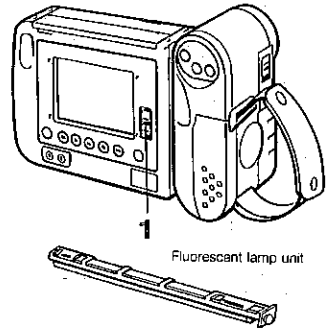
BOTTOM VIEW



INFRARED REMOTE CONTROL



FLUORESCENT LAMP BACKLIGHT



The fluorescent lamp backlight used in this VIEWCAM will eventually need replacing.
If you continue to use the VIEWCAM when the fluorescent lamp has almost reached the end of its service life, the "LAMP" indicator will appear in the center of the monitor screen, and the monitor will go off approximately one minute later. When this occurs, purchase a replacement lamp (CLMPV0007TA01) from your dealer or a SHARP Full Line Parts Distributor, and replace the old lamp.

REPLACING THE FLUORESCENT LAMP BACKLIGHT

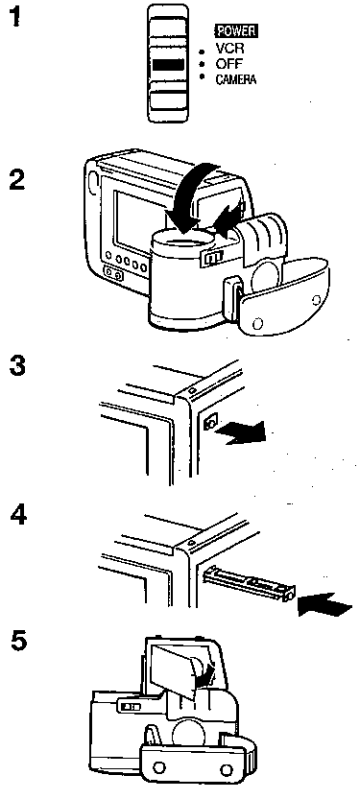
1 Set the POWER switch to OFF to turn off the VIEWCAM, and wait about 15 minutes for the lamp unit to cool down.

2 Rotate the lens halfway backward in the direction of the arrow, and then remove the lithium battery/fluorescent lamp compartment cover.

3 Carefully hold the end (white knob) of the fluorescent lamp unit with tweezers, and pull the lamp unit out.

4 Insert the replacement fluorescent lamp unit into the compartment. See note below.

5 Replace the lithium battery/fluorescent lamp compartment cover.



Notes

- Be sure to insert the replacement fluorescent lamp straight in, in the direction of the arrow, into the compartment. Do not press diagonally as it may cause contact failure.
- The fluorescent light may flicker when first turned on. Should this occur, turn off the VIEWCAM, and then turn it on again.

Cautions

- The fluorescent lamp is hot during and immediately after use of the VIEWCAM. Wait at least 15 minutes after turning the power off before attempting to change the lamp, to allow time for it to cool down.
- Attempting to change the fluorescent lamp while it is still hot may result in burns or other injuries.

5. DISASSEMBLY AND REASSEMBLY

Precautions before disassembly
1. Take the AC adaptor, battery, tape, etc. out of the unit.
2. When reassembling, be sure to lay and dress the leads and tighten up the screws in their original positions.
3. In repairing, be careful to protect the integrated circuitry and other components from static electricity.

5-1. DISASSEMBLING THE CAMERA SECTION

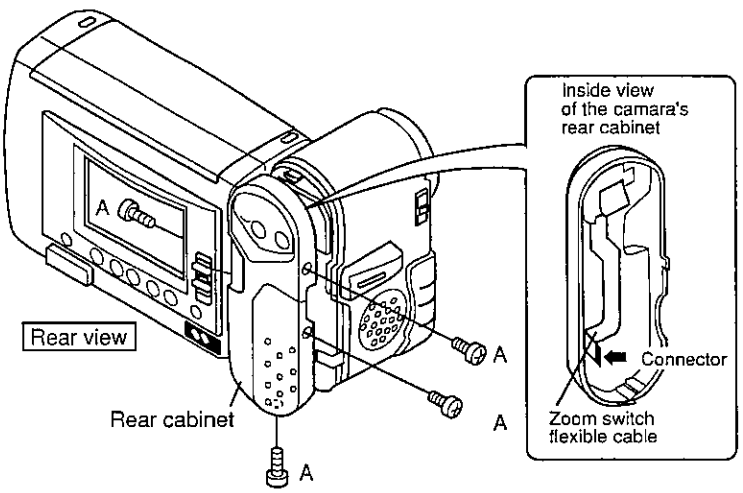
5-1-1. TYPES SCREWS (There are two different types of screws at the camera section.)

Fig. No.	Name	Shape	Color	Quantity
A	Screw	M2	Black	8
B	Tap screw	M2	Gold	4

5-1-2. PROCEDURE

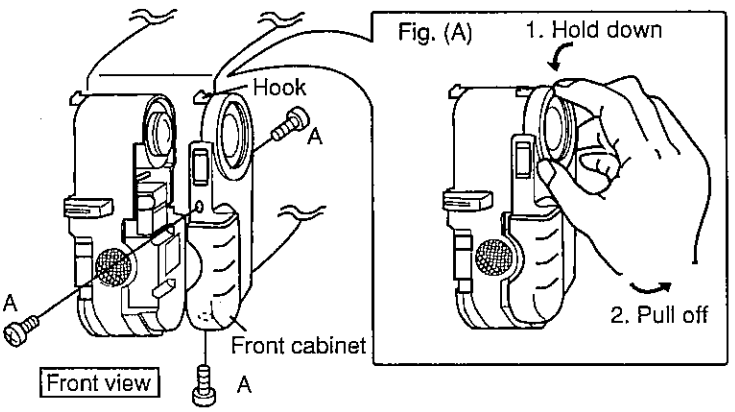
(1) Remove the camera's rear cabinet.

1) Unscrew the four screws.
2) Draw out the rear cabinet in the direction of arrow.
3) Disconnect the zoom switch flexible cable from the connector.



(2) Remove the camera's front cabinet.

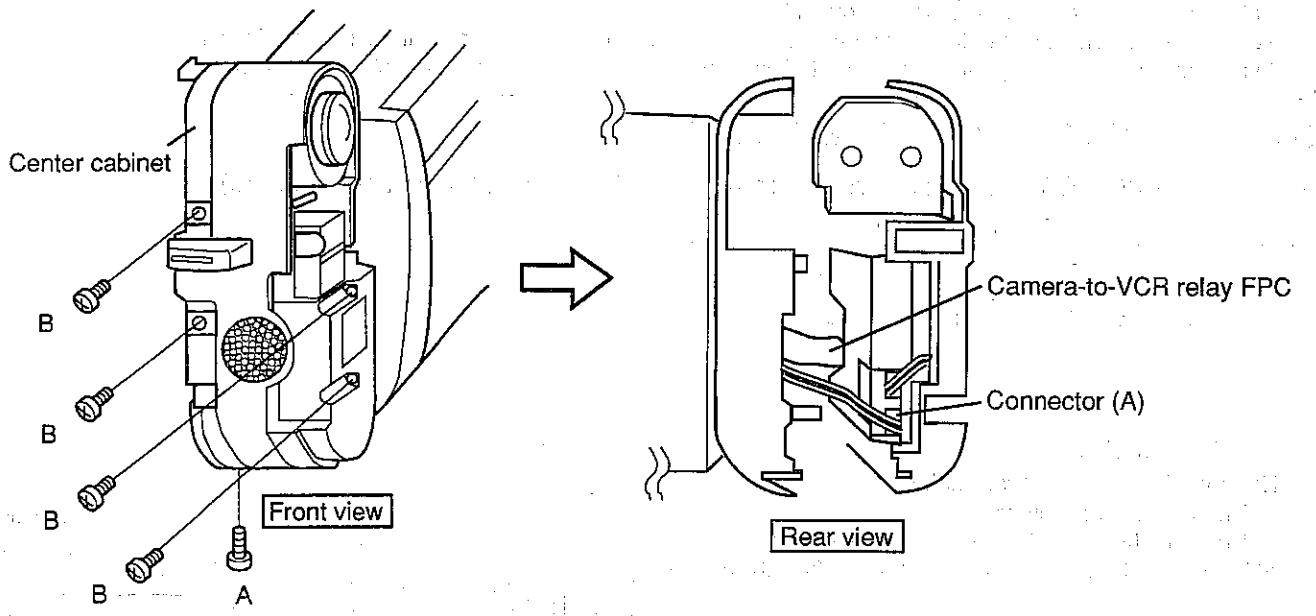
1) Unscrew the three screws.
2) Hold the front cabinet top with a finger to press the hook (see Fig. Ⓐ). Pull and unhook the cabinet.



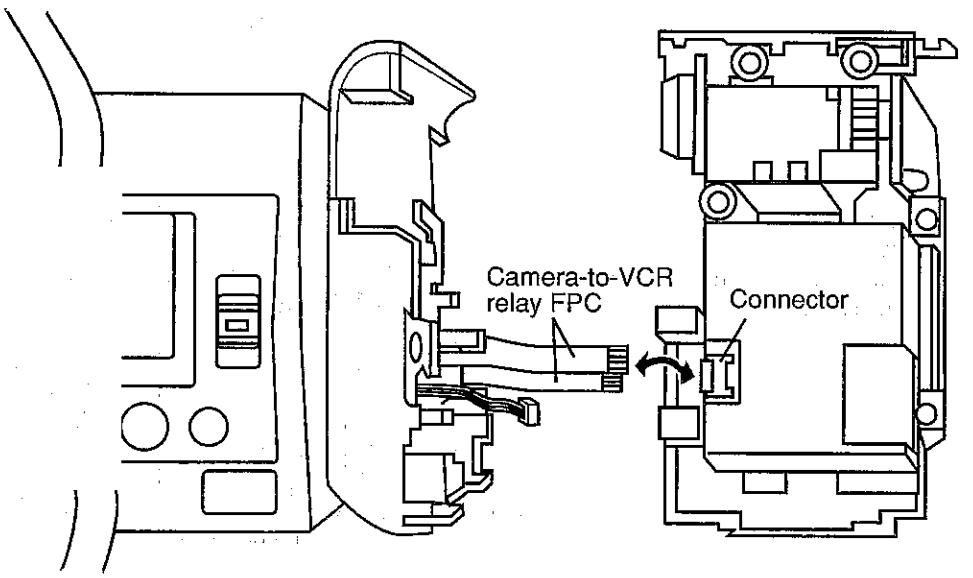
(3) Remove the camera's center cabinet.

1) Unscrew the five screws.

2) Open the center cabinet and disconnect the connector Ⓐ.



3) Disconnect the camera-to-VCR relay FPC.



5-2. DISASSEMBLING THE VCR/LCD SECTION

5-2-1. Types of screws (There are three different types of screws at the VCR/LCD section.)

Fig. No.	Name	Shape	Color	Quantity
A	Special Screw	M2	Gold	2
B	Screw	M2	Black	13
C	Tap Screw	M2	Gold	1

5-2-2. Procedure

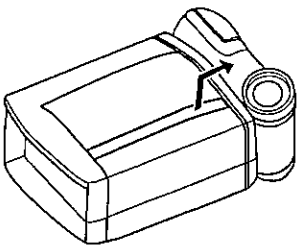
• Removing the cassette holder cover(VL-E30U/C only)

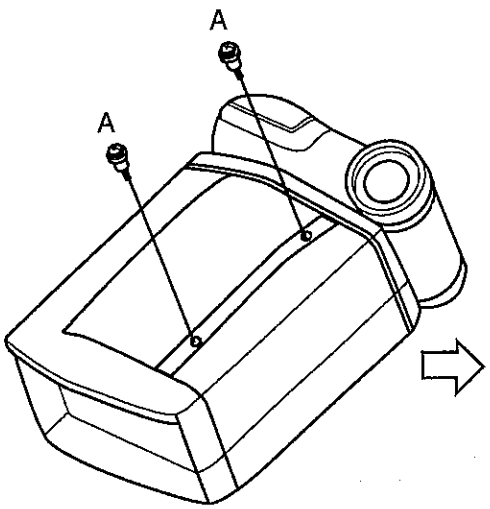
1) Keep the cassette controller section open.

2) Unscrew the cassette holder screws and remove the holder.

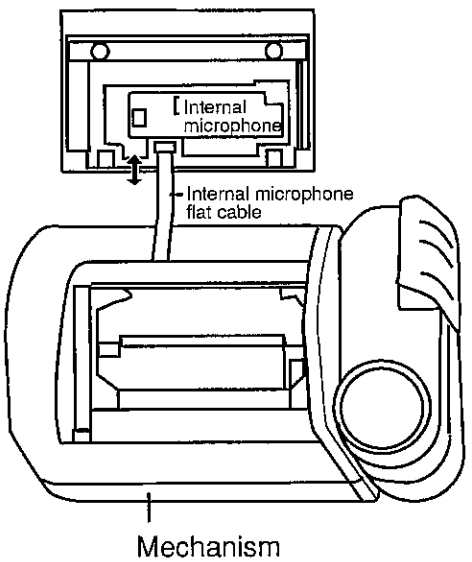
3) Remove the cassette holder cover.

a) Unscrew the two screws (screw No. A).
b) Detach the cassette holder cover.
c) Disconnect the internal microphone flat cable using the PWB connector removal tool (JIGTH-SS10).



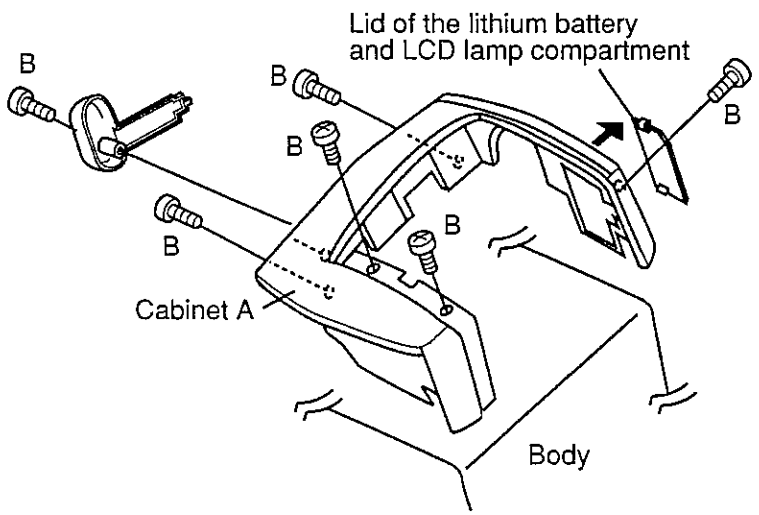


Inside view
of the cassette holder cover



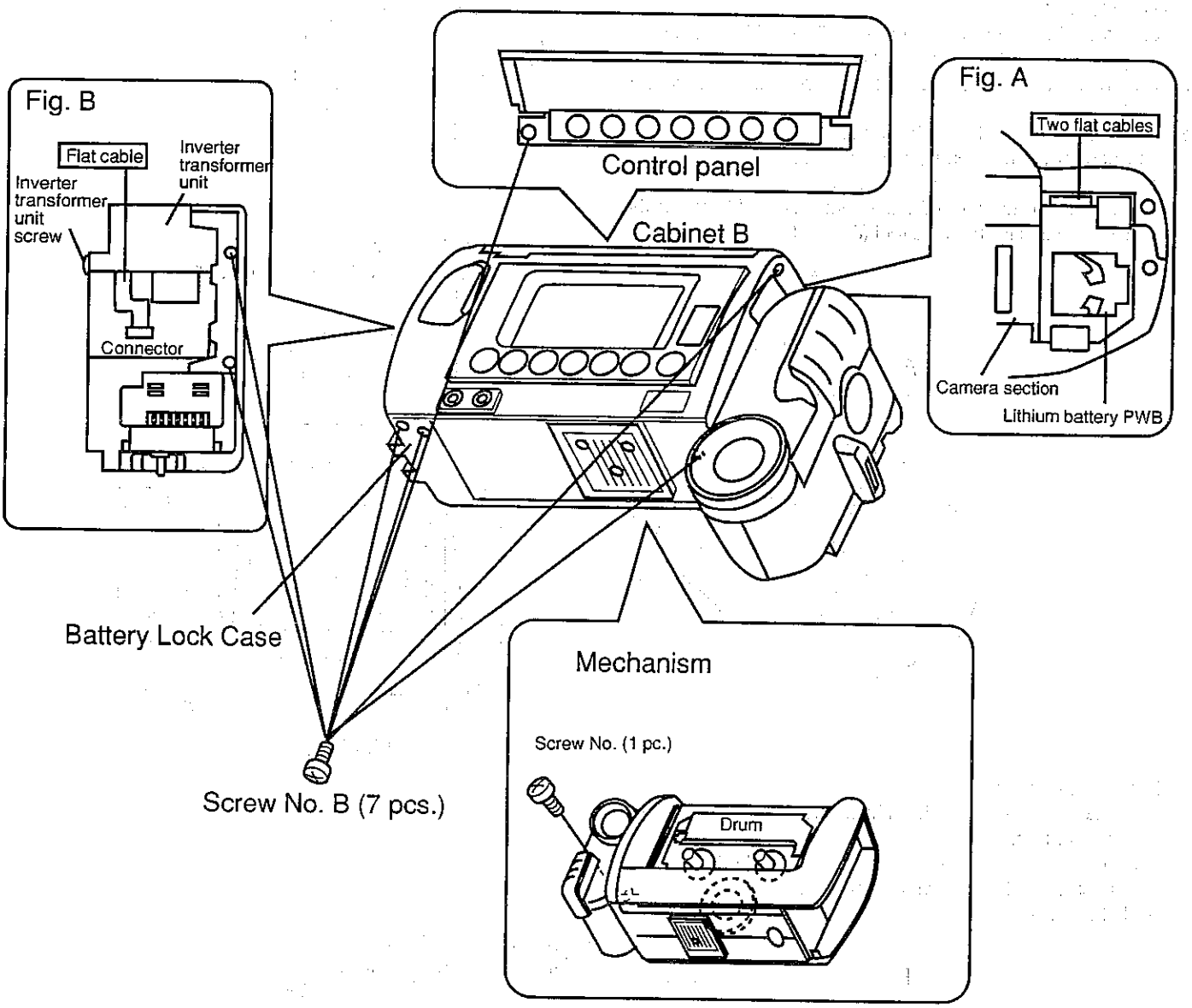
4) Remove the cabinet A.

a) Take out the lid of the lithium battery and LCD lamp compartment.
b) Unscrew the No. B screw and remove the bottom cover.
c) Unscrew the five screws (screw No. B).
d) Lift off the cabinet A.



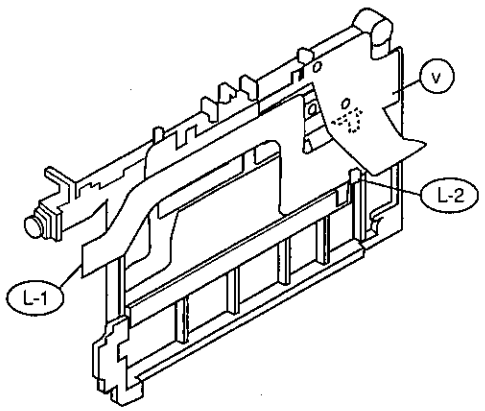
5) Remove the cabinet B (LCD panel).

1) Reverse the camera section as shown below.
2) Unscrew the nine screws (screw No. B: 7 pcs., screw No. C: 1 pc.).
3) Disconnect the two flat cables using the PWB connector removal tool (JIGTH-SS10). (Fig. A)
4) Unscrew the inverter transformer unit screw and disconnect the flat cable from the connector. (Fig. B)
5) Remove Battery Lock Case.
6) Lift off the cabinet B. (Be careful not to break the flexible cable of the inverter transformer unit.)



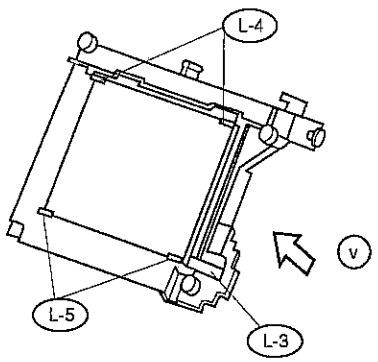
5-3. Removing the LCD Unit

(1) Lift the lamp terminal insulating plate Ⓥ and undo the LCD FPC L-1 off the LCD holder's hook L-2.

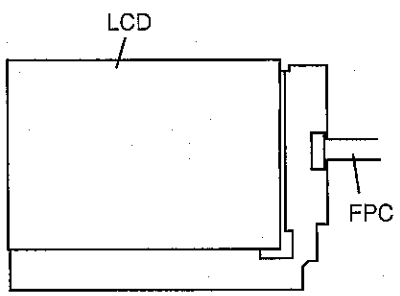


(2) Tilt the LCD holder's lower right hook L-3 outwards and undo the LCD glass off the hook. Next lift off the LCD.

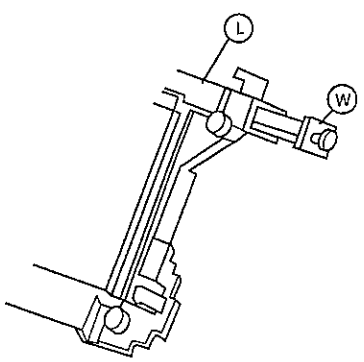
(Be careful not to touch the LCD cable that runs on the right of the LCD. The LCD may be damaged.)



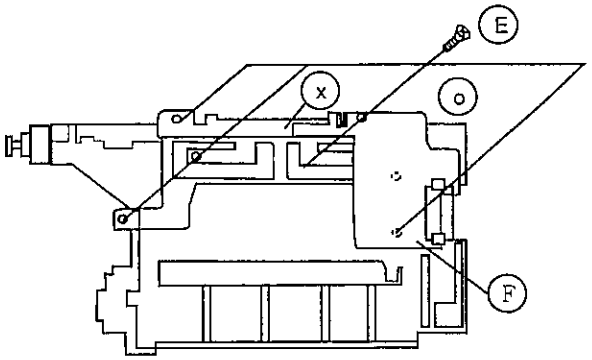
(3) Disconnect the LCD FPC from the LCD connector.



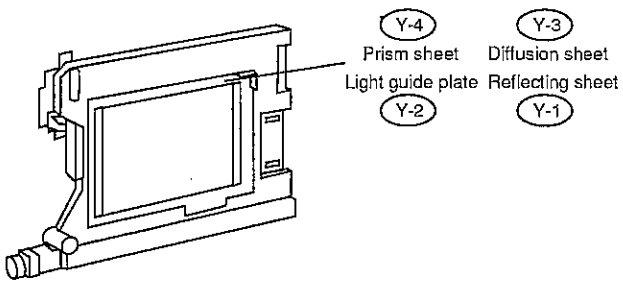
(4) Remove the lamp holder Ⓦ from the LCD holder.



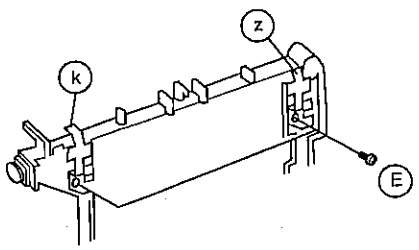
(5) Unscrew the four fixing screw Ⓔ (LX-HZ3025CEFF) off the LCD holder and the light guide plate leaf spring Ⓧ. (Remove the lamp terminal insulating plate Ⓕ together off position.)



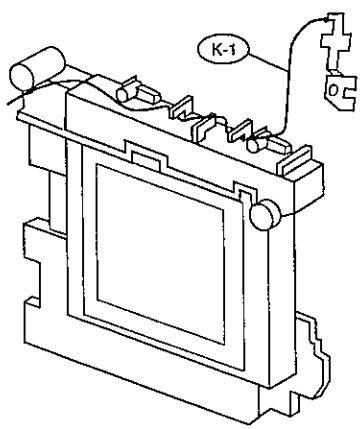
(6) Remove the reflecting sheet Y-1, light guide plate Y-2, diffusion sheet Y-3 and prism sheet Y-4 from the LCD holder.



(7) Unscrew the two fixing screws Ⓔ (LH-HZ3025CEFF) off the LCD holder and the lamp terminals (Ⓩ: high voltage, Ⓚ: grounding).



(8) Disconnect the lamp terminal (grounding) lead K-1 from the LCD holder.

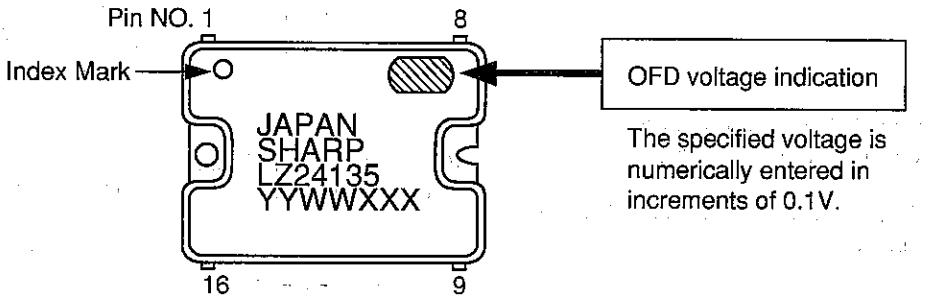


5-4. REPLACEMENT OF CCD SENSOR

5-4-1. BEFORE REPLACEMENT

1) The CCD image sensor is more sensitive to electrostatic breakage than C-MOS LSI. Therefore sufficient means to prevent electrostatic damage must be taken when it is replaced.
- Ground the soldering iron.
- Ground also the human body, using the wrist strap(through an 1 Mohm resistor).
- Until the CCDsensor is mounted on the PWB, fit it to the conductive sponge, and short-circuit the foot lead.

2) Take utmost care so that the surface glass of CCD sensor and optical filter are not contaminated and damaged. If any contamination is found, for example fingerprint, wipe it off with silicon paper or clean chamois skin.
3) When replacing the CCD sensor, use the antistaic grounded soldring iron, and perform quickly soldering.
4) Before mounting the CCD sensor, read the V-OFD voltage shown on the rear side of CCD sensor, and record it. When adjisting V-OFD voltage, refer to item 2 of "Adjustment Procedure".



Note:
Indication of voltage (ofd) set value.
Voltage set value is indicated on the back of the CCD sensor.

V-OFD voltage marked on the back of CCD

5-4-2. REMOVAL OF CCD

1) Unsolder the CCD sensor leads from the sensor PWB.
2) Remove the screw (1) to take out the sensor PWB.
3) Remove the two screws (2), and remove the sensor holder and CCD sensor.

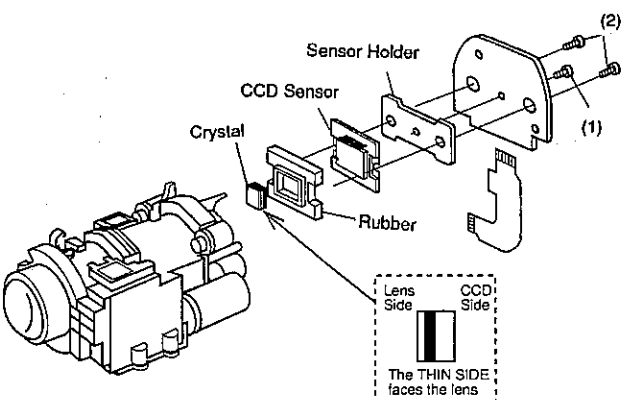
5-4-3. MOUNTING OF CCD

1) Place the lens unit upright (since the CCD sensor mount ID faces upward, care must be taken so as not to damage the front lens of unit), put the crystal filter first and then the dust protection rubber into the CCD holder of lens unit. Set the crystal unit with its thin side toward the lens unit.
2) Place the CCD sensor so that the its No. 1 pin is at the right lower (Positioning hole to be at right), and put the CCD sensor into the CCD holder. For smooth and tight fitting, press the right lower part of back of CCD sensor, and then press the left upper part.

Note: Pay attention to the direction of CCD sensor.

3) Place the sensor holder so that its two round markings be visible, and fix the sensor holder with the two screws (2).
4) Mount the sensor PWB so that the CCD sensor leads go thorough the PWB holes. Fix the PWB with the screw (1).
5) Solder the CCD sensor lead to the sensor PWB.

Note: Take care not to apply excessive heat.



5-5. INITIAL SETTING OF E²P ROM IC

5-5-1. IC705 (E²P ROM)

When the IC705 has been replaced, make the following settings and adjustments.

• **System code setting**

* Set the test mode to the VCR adjustment mode. Take the following steps.

1) Destination code — Write the destination data (model numbers) to the addresses 02 (Main) and 03 (Sub).

Destination	02 (Main)	03 (Sub)
U	01	FE
C	01	FE

For calling the addresses and writing the data, refer to the VCR adjustment mode setting on page 6-4.

2) Specification switching code

Address	Data
04 (Main)	00
05 (Sub)	FF

3) Menu selection code

Address	Data
06 (Main)	00
07 (Sub)	FF

4) Software selection code

Address	Data
08 (Main)	00
09 (Sub)	FF

* After setting the above codes, clear the VCR adjustment mode and turn off the power.

Adjustments to follow

Make the system controller servo, VCR, and LCD adjustments according to their respective instructions (see pages 6-5 to 6-11).

5-5-2. IC502 (EEPROM)

When the IC502 has been replaced, make the camera adjustment according to its instructions. (see pages 7-5 to 7-8).

6. ADJUSTMENT OF VCR SECTION

6-1. Before starting the electric circuit adjustment

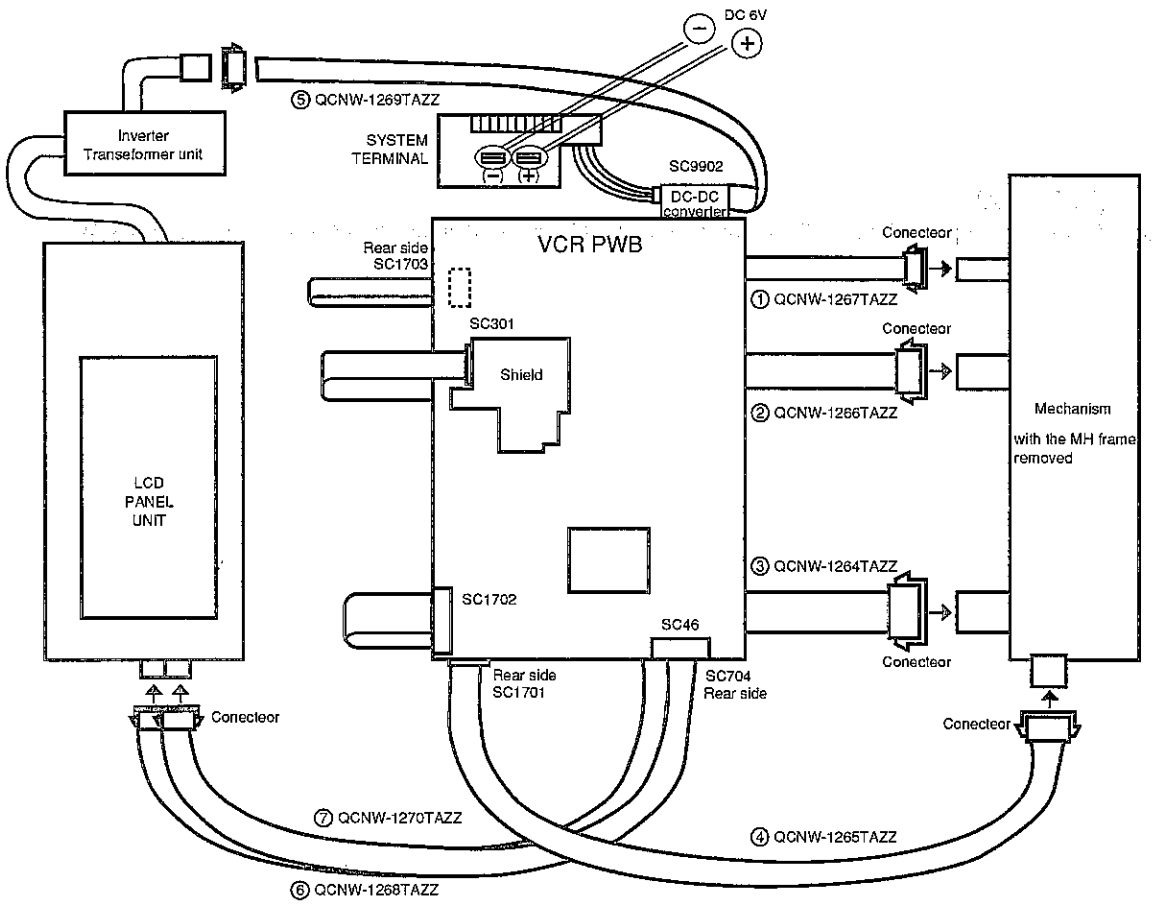
- Electric circuit adjustment becomes necessary, in most cases, when any of the wear mechanical parts or the video head has been replaced. Before starting the electric circuit adjustment, be sure to check that the mechanical parts work well (i.e., the mechanical parts have all been perfectly adjusted). In case a trouble or troubles are found in the electric circuitry, be sure to pinpoint the cause(s) by using the measuring instruments described below. After locating the trouble spot(s), then proceed to repair, replacement or adjustment. Do not change the positions of the controls when adequate measuring instruments are not available.
- In order to implement a higher-density, smaller machine, most of the electric circuit parts used on the PWBs are of small-sized, surface-mounted type. For replacing part(s) as after-sales service, work with a soldering iron as speedily as possible. The heat resistance of the surface-mounted components is poor, when compared with the larger-sized discrete parts used for television sets and stationary decks, owning to their small sizes. Therefore, exercise due care to avoid long-time exposure of the pins of these parts to the heat of the soldering iron which may possibly damage them. Such care should be exercised especially for chip-layer capacitor replacement. It is advisable to use a temperature-controlled ceramic soldering iron (temperature at the tip: 250°C, contacting time: less than 5 seconds).

< Adjusting the video/LCD section >

- Measuring instruments:

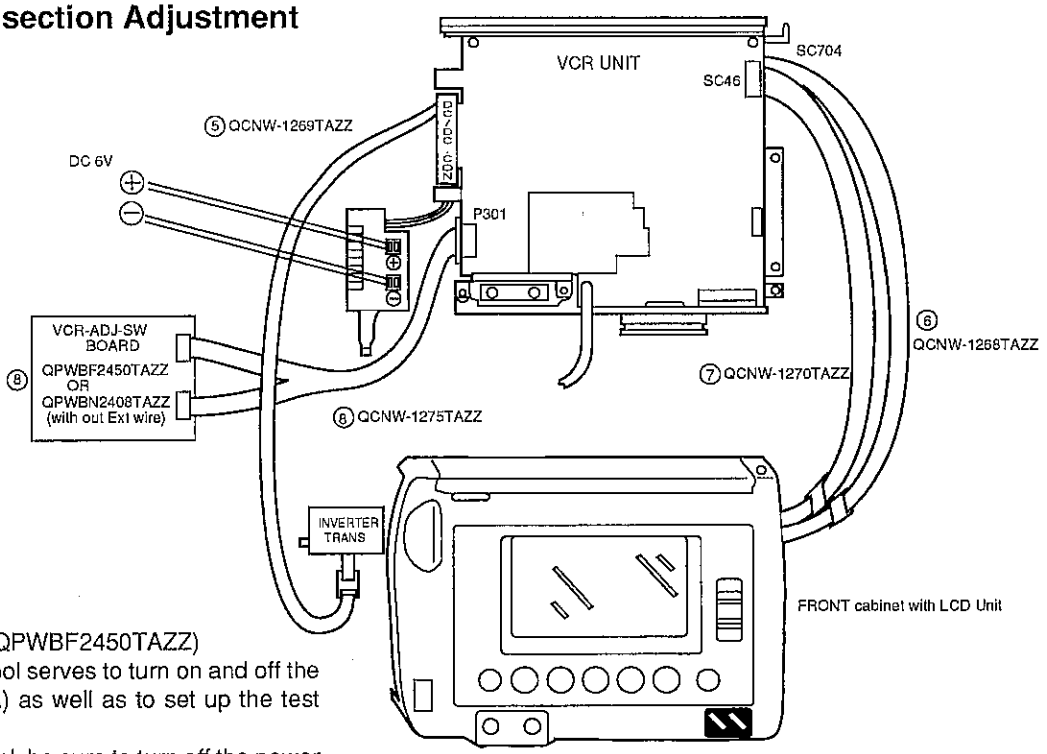
*Color monitor TV set	*Oscilloscope	*Vector scope
*Digital voltmeter	*Frequency counter	
*DC power supply	*Signal generator (NTSC pattern generator LCG-401/401YC: Leader-made)	
*Audio generator (CR oscillator)	*Video recording tape	
*Alignment tapes JIGWR5-5NSP (For Y/C, audio nd servo adjustments)		
*AC adapter	*DC cable (AC adapter accessory)	
*Stereo AV output cable (accessory)	*Video extension cables	

6-2. Connections for VCR Section Adjustment



6-3. Servicing the VCR section Adjustment

6-3-1Typical connections



- Adjustment mode setting tool (QPWBF2450TAZZ)
  The QPWBF2450TAZZ tool serves to turn on and off the power (VCR or CAMERA) as well as to set up the test modes.
  (Before connecting this tool, be sure to turn off the power of the LCD Viewcam. Then connect the tool and use its VCR/OFF/CAMERA selector switch.)

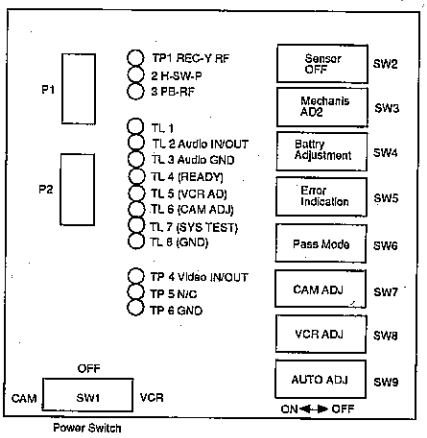
ADJUSTMENT AND SERVICING OF VCR SECTION

LIST OF VCR JIGS

NO.	JIG ITEM	PARTS CORD	PRICE CORD	CONTIGURATION	NOTE
1	Extension Wire Connected to SC1703 → L Motor	QCNW-1267TAZZ	AX	(6 Pin)	N
2	Extension Wire Connected to SC301 → Head	QCNW-1266TAZZ	AY	(9 Pin)	N
3	Extension Wire Connected to SC1702 → W1714	QCNW-1264TAZZ	BA	(28 Pin)	N
4	Extension Wire Connected to SC1701 → Cap Motor	QCNW-1265TAZZ	AX	(7 Pin)	N
5	Extension Wire Connected to SC9902 → Inv Trans	QCNW-1269TAZZ	AY	(6 Pin)	N
6	Extension Wire Connected to SC704 → R&P SW UNIT	QCNW-1268TAZZ	AY	(11 Pin)	N
7	Extension Wire Connected to SC46 → LCD Panel	QCNW-1270TAZZ	AY	(18 Pin)	N
8	Extension Wire Connected to P301 → VCR ADJ JIG	QCNW-1275TAZZ	BL		N
9	VCR Adjustment SW Board Connected to Ex tension Wire (QCNW-1275TAZZ)	QPWBF2450TAZZ	BF		N *
10	Alignment Tape (Y/C Audio Alignment)	JIGWR5-5NSP (NTSC)	BU		
11	Alignment Tape (Tape Path Alignment)	JIGWR2-1NP (NTSC)	CS		
12	Alignment Tape	JIGWR5-5CSP (PAL)	BU		
13	Alignment Tape	JIGWR2-1CP (PAL)	CP		

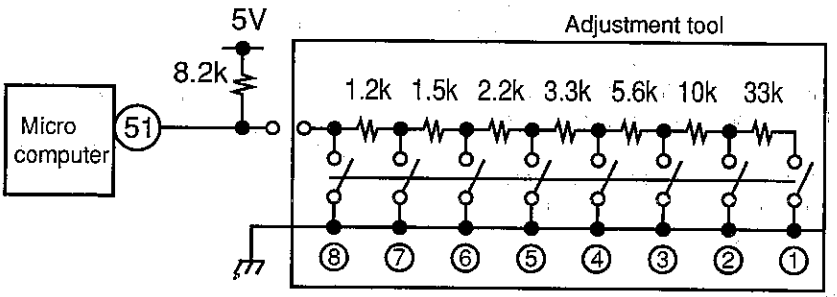
NOTES: 1. N Indicates the new jigs.
2. * If use QPWBN2408TAZZ Please interchange extension wire.
(Original → QCNW-1275TAZZ)

• Usage of adjustment mode setting jig(QPWBF2450TAZZ or QPWBN2408TAZZ)



• Types of test modes

Any of the eight test modes can be set up by changing the input voltage at pin (54) of IC701. During any test mode, the REC Start/Stop commands are not accepted.



Use the SW1 thru SW8 switches on the adjustment tool to select the following test modes.

SW No.	Title	Contents	Sensor on/off
1	Sensors off	All sensors but the cassette controller switch, dew sensor and battery sensor stay off.	
2	Mechanism adjustment mode	① Automatic SP/LP detection prohibited ② Different-mode detection prohibited ③ ATF sampling limited to center	All sensors on
3	Automatic battery sensor adjustment	Battery sensor's input voltage put in memory.	
4	Error display Battery adjustment error display	Past errors appear on the counter display of the viewfinder. Battery sensor's adjustment errors are displayed at the right of the "past errors" area.	All sensors on All but sensors on
5	PASS mode	Track shift mode (1/4 shift)	All sensors on
6	Camera adjustment mode	Camera adjustment mode	[VCR interrupted]
7	VCR adjustment mode	VCR adjustment mode	
8	Automatic switching point adjustment	Play standard tape and call this mode. Switching point is automatically adjusted.	
9	Normal mode	For normal operation	All sensors on

① When the battery adjustment mode is selected from the camera adjustment mode with a cassette with the erase protection tab, the VCR is automatically put in the REC mode.

• Below discussed are these eight test modes.

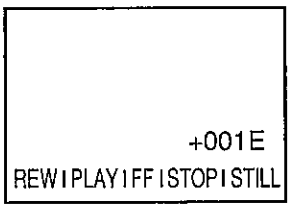
① [TEST MODE 1] Sensors off mode

All the sensors, except for the cassette controller switch, dew sensor and battery sensor, stay off. This enables to bring the VCR in the loading mode without tape. The VCR/camera performance can now be checked with no tape inside.

② [TEST MODE 2] Mechanism adjustment mode
Used to adjust the tape traveling condition. Stable tape running is ensured for smaller RF envelope fluctuations and better ATF tracking, which would otherwise cause poor playback. The following actions are taken.
① Automatic SP/LP detection prohibited
② Different-mode detection prohibited
③ ATF sampling limited to center

③ [TEST MODE 3] Automatic battery alarm adjustment
Used to automatically adjust the voltage level which makes the "battery" appear on the LCD display.

④ [TEST MODE 4] Battery alarm check/error display
• The difference between the preset battery alarm voltage and the current supply voltage is displayed as follows.
• A past error is displayed at the right of the current battery alarm error.



⑤ [TEST MODE 5] PASS mode
Used to adjust the tape traveling condition. The tracking is shifted by 1/4 from the center to make the tape running-related RF envelope fluctuations easier to observe.

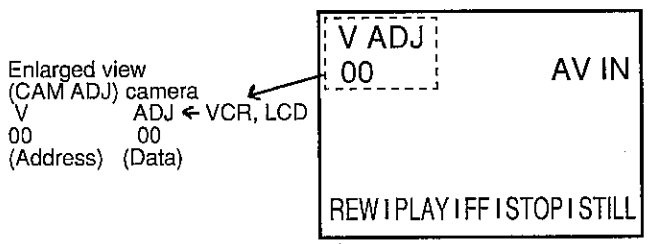
⑥ [TEST MODE 6] Camera adjustment mode
Used to adjust the camera section. (For details, see Servicing the Camera Section.)

⑦ [TEST MODE 7] VCR adjustment mode
Used to adjust the VCR section. (For details, see Servicing the VCR Section.)

⑧ [TEST MODE 8] Automatic switching point adjustment
Used to automatically adjust the playback switching point. (For details, see Automatic Adjustment of the Playback Switching Point.)

6-3-2. Setting up the VCR section adjustment mode (camera section adjustment)

• Select adjustment items by using addresses. Rewrite the adjustment data to change the settings.
Below shown the adjustment procedures and on-screen display.

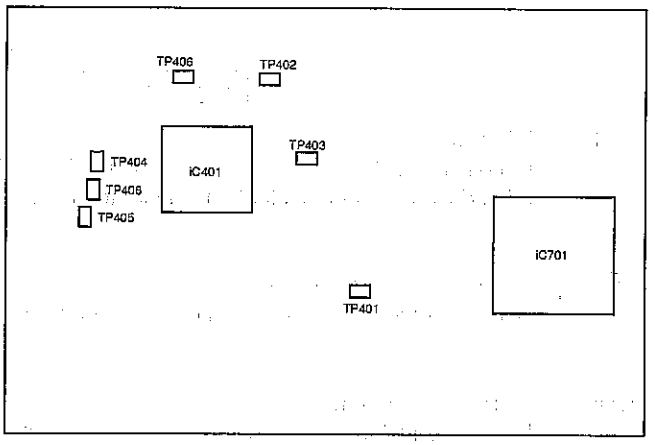


	Procedural steps	Display (: flashing)
①	Turn up or down the flashing hexadecimal number with the FF or REW key to select the address of a desired adjustment item. (Initial address: 00H) Note: The addresses change as follows. 7E — 7F — 00 — 01 — 02	V ADJ
②	Press the PB key to read the data of the selected address.	V ADJ 2C A3
③	Turn up or down the data setting with the FF or REW key. The data display starts flashing.	V ADJ 2C
④	Press the PB key again to write the data setting into the selected address.	V ADJ 2C 72
⑤	Press the STOP key in the above step ② or ④, and the screen returns back to the step ①.	V ADJ

When the FF or REW key is held down for 0.3 second or longer, the address selection is repeated in cycles of 100 msec. The data setting changes by ± 4 by holding the key down for 2 seconds or longer.

6-4. ADJUSTING THE VCR CIRCUIT

• Test Points on the Video PWB



6-4-1. ADJUSTING THE POWER CIRCUIT

17.5V adjustment

Measuring instrument	Digital voltmeter
Mode:	REC
Input signal (tape):	—
Test point:	Pin 13 of SC9901 in the DC/DC converter
Adjustment control:	R943
Adjustment level:	17.5 ± 0.1 V

Adjust R943 so that the voltage at pin 13 of SC9901 located in the DC/DC converter be 17.5 ± 0.1 V.

6-4-2. ADJUSTING THE SYSTEM CONTROLLER/SERVO CIRCUITS

1. Automatic playback switching point adjustment

Measuring instrument	Oscilioscope
Mode:	PB
Input signal (tape):	JIGWR5-5NSP
Test point:	—
Adjustment address:	—
Adjustment level:	—

* This model is provided with the automatic playback switching point detection/memory function. This point therefore cannot be shifted manually.

1) Set the CAMERA/OFF/VCR selector to the VCR position.
2) Play back the standard tape (JIGWR5-5NSP).
3) Press once the SW8 located on the adjustment tool. Automatic switching point adjustment starts.
4) When the adjustment is complete, the unit stops automatically.

Note:
If the automatic adjustment fails in a certain time, the tape is automatically ejected and the adjustment mode is cleared.

Major causes of adjustment failure:
1) The tape comes to its end during the adjustment.
2) The mechanism gets in trouble(drum sensor failure, for example) during the adjustment.
3) The adjustment does not finish in a certain period of time (head amplifier failure, for example).

2. Battery alarm adjustment

Measuring instrument	Check on the monitor screen
Mode:	CAMERA REC
Input signal (tape):	—
Test point:	Pins 5 and 6 (GND) of P9901
Adjustment address:	—
Adjustment level:	+5.5 V

* Connect the camera section.

1) Set the CAMERA/OFF/VCR selector to the CAMERA position.
2) Load a blank tape.
3) Turn on the SW3 of the adjustment tool to set up the battery alarm adjustment mode.
4) Feed the supply voltage so that the voltage between pins 5 and 6 (GND) of P9901 be 5.5 V.
5) Press the PLAY button to start automatic adjustment.
6) The battery symbol appears on the LCD display and disappears again. Now the adjustment is complete.
7) Turn off the SW3 of the adjustment tool.

6-4-3. Y/C CIRCUIT ADJUSTING PROCEDURES

Input Signal Conditions (Adjustment)
Instrument set-up

For electrical adjustments of the Y/C circuit, a pattern generator is used to feed the video signal. It is important that the video signal output is as specified. Connect the oscilloscope to the video input and output terminals. Make sure the oscilloscope waveform of the video signal is as follows: video sync signal's amplitude at about 0.3 Vp-p; video portion's amplitude at about 0.7 Vp-p; burst signal amplitude at about 0.3 Vp-p and its top and bottom as flat as possible; and the level ratio of the burst signal to the red bar at 0.30 : 0.66. Figure A shows the video signal waveform for the standard color bars.

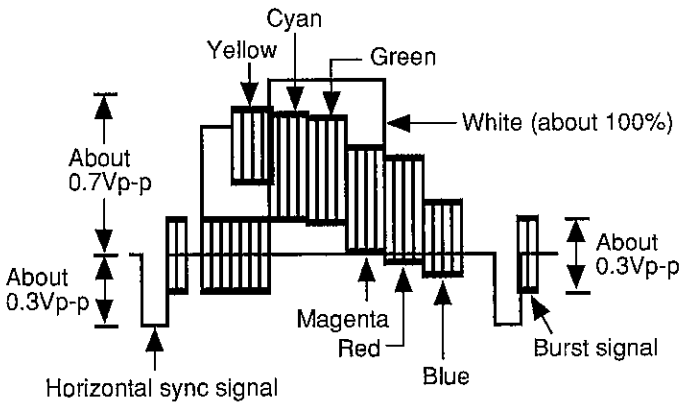


Figure A.
Color bar signal from pattern generator

• When there is no pattern generator available:

In this case, shoot a color bar chart (JIGCHART-4) with a completely adjusted camcorder. Set the illumination so that the camcorder's video signal output (terminated with 75-ohm impedance) is as shown in Figure B.
This color bar signal can be used as an input signal for electrical adjustments.

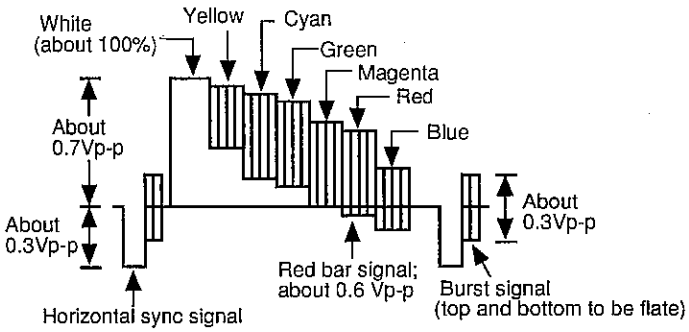


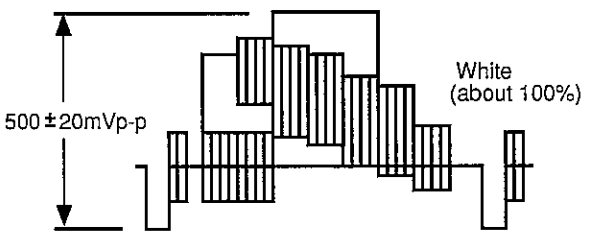
Figure B.
Color bar signal obtained by camcorder

1. EE level adjustment

Measuring instrument	Oscilloscope
Mode:	EE (VCR STOP)
Input signal (tape):	Color bar
Test point:	TP401/TP408 (GND)
Adjustment address:	14
Adjustment level:	500 ± 20 mVp-p

* Purpose: To optimize the brightness in the EE mode.
* On-monitor observation: Brightness to change.

1) Connect the adjustment tool to the TEST2 terminal (P301).
2) From the menu, set the AV input/output selection to the input mode. Feed the color bar signal to the video input/output terminals.
3) Set the VCR to the STOP mode.
4) Turn on the SW7 on the adjustment tool. (The VCR adjustment mode is set up.)
5) Set the address to 14.
6) Measure the voltage at TP401 and change the address data so that the level between the sync tip and the white peak be 500 ± 20 mVp-p.

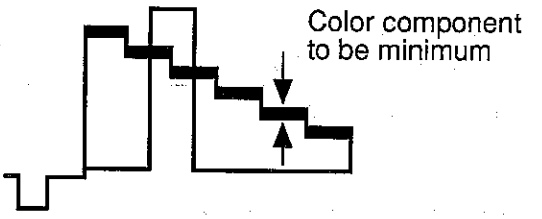


2. Comb filter adjustment

Measuring instrument	Oscilloscope
Mode:	EE (VCR STOP)
Input signal (tape):	Color bar
Test point:	TP402/TP408 (GND)
Adjustment address:	15 (Phase),16 (Gain)
Adjustment level:	Minimum chroma level

* Purpose: To separate the Y and C signals.
* On-monitor observation: Cross color and dot interference to increase.

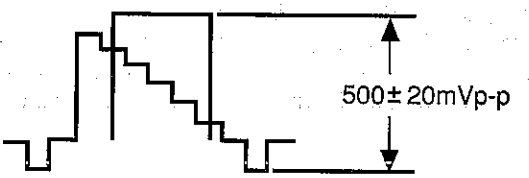
1) Using the control switches, set up the sepcified addresses.
2) Change the address data, in the order of phase, gain and phase again, to bring the residual chroma component at TP402 to minimum.



3. Preemphasis input level adjustment

Measuring instrument	Oscilloscope
Mode:	EE (VCR STOP)
Input signal (tape):	Color bar
Test point:	TP403/TP408 (GND)
Adjustment address:	17
Adjustment level:	500 ± 20 mVp-p

1) Using the control switches, set up the specified address.
2) Measure the voltage at TP403 and change the address data so that the level between the sync tip and the white peak be 500 ± 20 mVp-p.



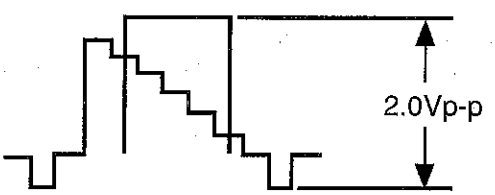
4. Y FM carrier adjustment

Measuring instrument	Frequency counter
Mode:	EE (VCR STOP)
Input signal (tape):	None
Test point:	TP404/TP408 (GND)
Adjustment address:	18
Adjustment level:	4.38 ± 0.02 MHz

1) Using the control switches, set up the specified address.
2) Keep the video input off.
3) Change the address data so that the frequency counter should read 4.38 ± 0.02 MHz at TP404.

5. Y FM deviation adjustment

Measuring instrument	Oscilloscope
Mode:	VCR REC/PB
Input signal (tape):	Color bar
Test point:	TP405/TP408 (GND)
Adjustment address:	19
Adjustment level:	2.0 ± 0.1Vp-p



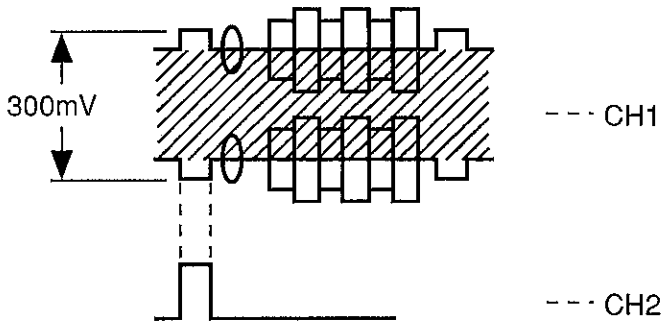
1) Using the adjustment tool, once clear the VCR adjustment mode.
2) Load a Normal tape.
3) Start recording the color bar signal and stop recording after a while. Get to the starting point of the recording.
4) Make the menu appear on the screen. Set the input/output selection to the output mode.
5) Play back the recording and measure the level between the sync tip and the white peak at TP405.
6) Using the adjustment tool, set up the VCR adjustment mode again. With the control keys, set up the specified address.
7) If the level measured in the above step 5 is larger than specified, decrease the data using the control keys; if in the other way, increase the data.
8) Repeat the above steps 1) thru 7). Change the data so that the playback video signal level at TP405 be 2.0 Vp-p.

6. Y recording current adjustment

Measuring instrument	Oscilloscope
Mode:	EE (VCR STOP)
Input signal (tape):	Color bar
Test point:	CH1; pin 1 of TEST2 connector CH2; TP406
Adjustment address:	1A
Adjustment level:	300 ± 10 mVp-p

* Make triggering at CH2.

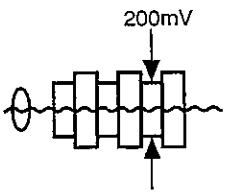
1) Using the adjustment tool, once clear the VCR adjustment mode. From the menu, select the input mode.
2) Feed the color bar signal to the video input/output terminals.
3) Using the adjustment tool, set up the VCR adjustment mode again. With the control keys, set up the specified address.
4) Measure the amplitude at the sync tip of the waveform that appears at pin 1 of the TEST2 connector (adjustment tool TP1). Change the address data to obtain 300 mVp-p.



7. C recording current adjustment

Measuring instrument	Oscilloscope
Mode:	EE (VCR STOP)
Input signal (tape):	Color bar
Test point:	Pin 2 of TEST2 connector
Adjustment address:	1B
Adjustment level:	Red portion; 200 ± 10 mVp-p

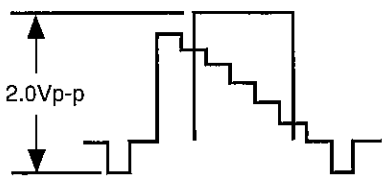
1) Using the control switches, set up the specified address.
2) Change the address data so that the red portion of the chroma signal at pin 2 of the TEST2 connector (adjustment tool TL1) be 200 ± 10 mVp-p.



8. Y playback level adjustment

Measuring instrument	Oscilloscope
Mode:	PB
Input signal (tape):	JIGWR5-5NSP
Test point:	TP405
Adjustment address:	1C
Adjustment level:	2.0 ± 0.1 Vp-p

1) Turn off the SW7 (VCR adjustment mode) on the adjustment tool.
2) Set the AV input/output selection to the output mode. Keep the terminal open.
3) Turn on the SW7 (VCR adjustment mode) on the adjustment tool.
4) Using the control switches, set up the specified address.
5) Change the address data so that the level between the sync tip and the white peak at TP405 be 2.0 ± 0.1 Vp-p.

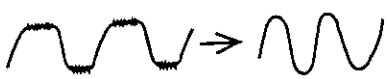


6-4-4. AUDIO ADJUSTMENT

1. Filter fo adjustment

Measuring instrument	Oscilloscope
Mode:	PB
Input signal (tape):	JIGWR5-5NSP
Test point:	SC601(2) (AUDIO IN/OUT)
Adjustment address:	12
Adjustment level:	Clear waveform

1) Connect the oscilloscope to the AUDIO OUT terminal (adjustment tool TL2, TL3 GND).
2) Using the adjustment tool, set up the VCR adjustment mode. With the control keys, set up the address 12.
3) Play the standard tape (JIGWR5-5NSP) and change the address data until the waveform on the oscilloscope screen becomes clearest (with no noise).



2. Deviation adjustment

Measuring instrument	VTVM (oscilloscope)
Mode:	PB
Input signal (tape):	JIGWR5-5NSP
Test point:	SC601② (AUDIO IN/OUT)
Adjustment address:	11
Adjustment level:	-8 ± 0.5 dBs (850-940 mVp-p)

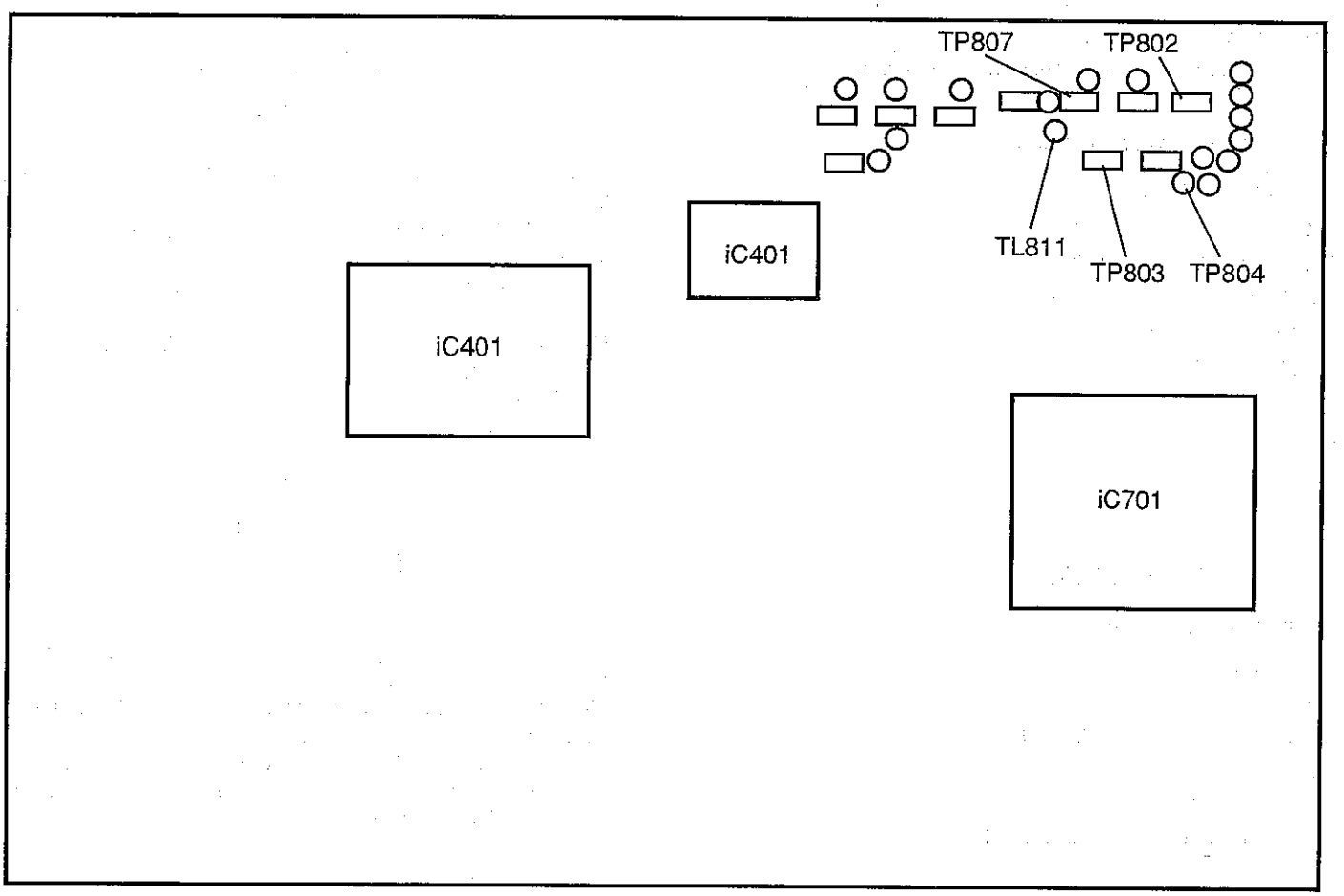
1) Connect the VTVM (oscilloscope) to the AUDIO OUT terminal (adjustment tool TL2, TL3 GND).
2) Play the standard tape (JIGWR5-5NSP) and measure the output level with the VTVM (oscilloscope).
3) Using the adjustment tool, set up the VCR adjustment mode. With the control keys, set up the address 11.
4) If the level measured in the above step 2 is greater than specified, modify the data in the (small) direction with the control Keys; if in the other way, in the (large) direction.
5) Repeat the above steps 2, 3 and 4 until the output level becomes -8 ± 0.5 dBs (850-940 mVp-p).

Self-recording/playback level checking

Measuring instrument	VTVM (oscilloscope)
Mode:	REC → PB
Input signal (tape):	400 Hz, -8 dBs (890 mVp-p)
Test point:	AUDIO IN/OUT
Adjustment address:	—
Adjustment level:	-8 ± 4 dBs (580-1370 mVp-p)

1) Using the menu key, set up the AUDIO IN mode.
2) Feed the audio signal of 400 Hz and -8 dBs to the AUDIO LINE IN terminal. Record the signal.
3) Connect the VTVM (oscilloscope) to the AUDIO OUT terminal.
4) Play back the recording and make sure that the level of the output waveform is -8 ± 4 dBs (580-1370 mVp-p on the oscilloscope). (In the playback mode, automatic switching is made from AUDIO IN to AUDIO OUT.)
5) If out of specification, readjust the above items 1 and 2 and recheck the self-recoding/playback level.

6-4-5. ADJUSTING THE LCD DISPLAY CIRCUIT



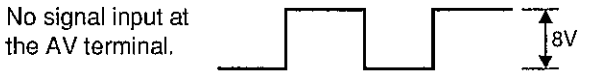
Adjustment procedures and connections are the same as with the VCR section.

1. Contrast adjustment

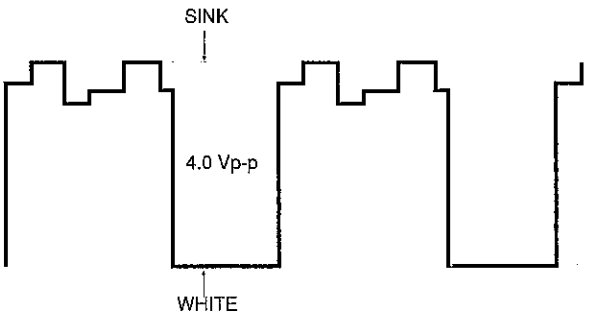
Measuring instrument	Oscilloscope
Mode:	VCR AV IN (EE mode)
Input signal (tape):	100% White
Test point:	TP803 (G-out)
Adjustment address:	24
Adjustment level:	4.0 ± 0.2Vp-p

Set the backlight to the (dark) mode.

1) Set up the address 26 "BRIGHT CTL LEVEL" without any signal to he AV IN terminal.



2) Feed the color bar signal to the AV IN terminal.
3) Ground TL811. (The 1H inversion stops.)
4) Observe the output waveform at TP803 (G-out), Change the address data so that the level between the white peak and the sync tip be 4.0 ± 0.2 Vp-p.



2. White balance (red) adjustment

Measuring instrument	Oscilloscope
Mode:	VCR AV IN (EE mode)
Input signal (tape):	None
Test point:	TP803, TP804
Adjustment address:	23
Adjustment level:	Less than 0.1 V between CH1 and CH2 outputs

* Oscilloscope settings: Probe; x 10
0.1 V/div.

1) Keep the AV IN terminal without any signal.
2) Set up the address using the control switches.
3) Connect the oscilloscope's CH1 to TP803 (G-out) and its CH2 to TP804 (R-out).
4) Make the waveform minimum.

3. White balance (blue) adjustment

Measuring instrument	Oscilloscope
Mode:	VCR AV IN (EE mode)
Input signal (tape):	None
Test point:	TP803, TP802
Adjustment address:	28
Adjustment level:	—

* Oscilloscope settings: Same as in Item 2 above

1) Keep the AV IN terminal without any signal.
2) Set up the address using the control switches.
3) Connect the oscilloscope's CH1 to TP803 (G-out) and its CH2 to TP802 (B-out).
4) Make the waveform minimum.

4. VCO adjustment

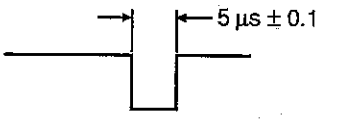
Measuring instrument	Frequency counter
Mode:	VCR AV IN (EE mode)
Input signal (tape):	None
Test point:	TP807
Adjustment address:	27
Adjustment level:	15.734 kHz ± 100 Hz

1) Keep the AV IN terminal without any signal.
2) Set up the address using the control switches.
3) Connect the frequency counter to TP807 and adjust the frequency to 15.734 kHz ± 100 Hz.

5. Horizontal position adjustment

Measuring instrument	Oscilloscope
Mode:	VCR AV IN (EE mode)
Input signal (tape):	Color bar
Test point:	TP807
Adjustment address:	2C
Adjustment level:	5 ± 0.1 µs

1) Feed the color bar signal to the AV IN terminal.
2) Set up the address using the control switches.
3) Connect the oscilloscope's probe to TP807 (HD pulse).
4) Adjust the pulse width to 5 ± 0.1 µs.



6. Common bias adjustment

Measuring instrument	—
Mode:	VCR AV IN (EE mode)
Input signal (tape):	Color bar
Test point:	—
Adjustment address:	2B
Adjustment level:	Blackest point

* Keep aging for about 1 minute before starting this adjustment. (This is important for stabilizing the backlight's brightness.) Keep the backlight in the BRIGHT mode.

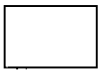
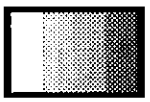
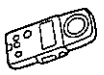
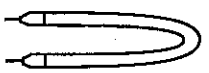
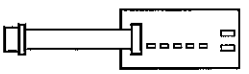
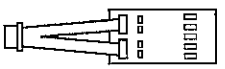
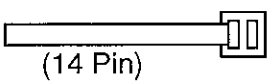
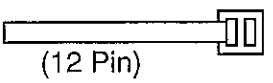
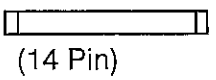
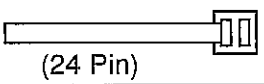
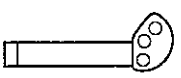
1) Feed the color bar signal, with the color component removed, to the AV IN terminal.
2) Set up the address using the control switches.
3) Observing the LCD monitor, change the address data until the black portion gets blackest. (Preset response time: 0.6 sec.)

7. ADJUSTMENT OF CAMERA SECTION

7-1. SERVICING OF CAMERA SECTION

(1) Object, measuring instrument and jigs necessary for camera section servicing

- Gray scale chart
- Frequency counter
- Rripod fixing jig
- White pattern chart
- Illuminometer
- Extension cable
- Color bar chart
- Color temperature meter
- Adjustment mode setting jig
- Siemens star chart
- Color temperature conversion filter HOYA "LB-165"
- Switch jig for adjustment
- Oscilloscope
- Digital voltmeter
- Color video monitor
- Vectorscope
- Video output cable
- Halogen light(2 pcs.)
- AC adapter

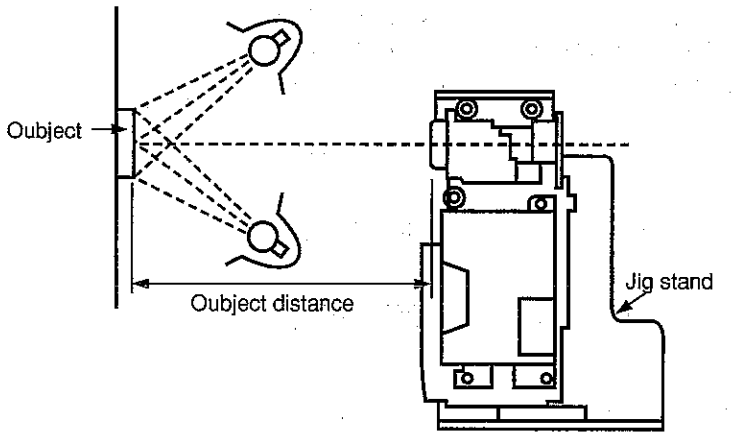
NO.	Jig Item	Parts Cord	Price Code	Configuration	Note
1	Camera Stand	JIGSTAND-MX7U	BU		*
2	Gray Scale Chart (390 x 520 mm)	JIGCHART-1	CP		
3	White Pattern Chart (390 x 520 mm)	JIGCHART-2	CG		
4	Color Bar Chart (240 x 320 mm)	JIGCHART-4	**		
5	Illuminometer (0~3000Lux)	JIGMETER-1	CT		
6	Color Thermometer (1600~400000°k)	JIGMETER-3	FF		
7	Color Temperature Convertion Filter	JIGHOYA-LB165	BH		
8	Siement Star Chart	JIGCHART-11	CE		
9	Torque Driver (1.5 kg.cm)	JIGTD1500RTDH	CB		
10	PC Board Connector Extractor	JIGTH-SS10	AW		
11	Camera Adjustment Switch Board (connected to P23)	QCNW-1220TAZZ	BD		N (PAL)
12	VCR Adjustment Switch Board with Extension Wire (connected to P301)	QPWBF2450TAZZ QPWBN2408TAZZ QCNW-1275TAZZ	BF BY BM		N ** N
13	Extension Wire (connected to SC19→SC702)	QCNW-1271TAZZ	AY	 (14 Pin)	N
14	Extension Wire (connected to SC18→SC701)	QCNW-1272TAZZ	AY	 (12 Pin)	N
15	Extension Wire (connected to SC2→SC1)	QCNW-1273TAZZ	AL	 (14 Pin)	N
16	Extension Wire (connected to SC8→Lens Unit)	QCNW-1274TAZZ	AZ	 (24 Pin)	N
17	Zoom Switch Wire (connected to Zoom SW→SC6)	QSW-Z0069TAZZ	AQ		N

Note:

1. Color temperature convertion filter (jig item No.7) may be obtained from HOYA Optics in your local market. 2. N: Indicates the new jigs.
3. *: Need Modification Please See S/M Page. 7-3. **: If use QPWBN2408TAZZ, Please Interchange Extension Wire.
(Original→QCNW-1275TAZZ)

(2) SETTING

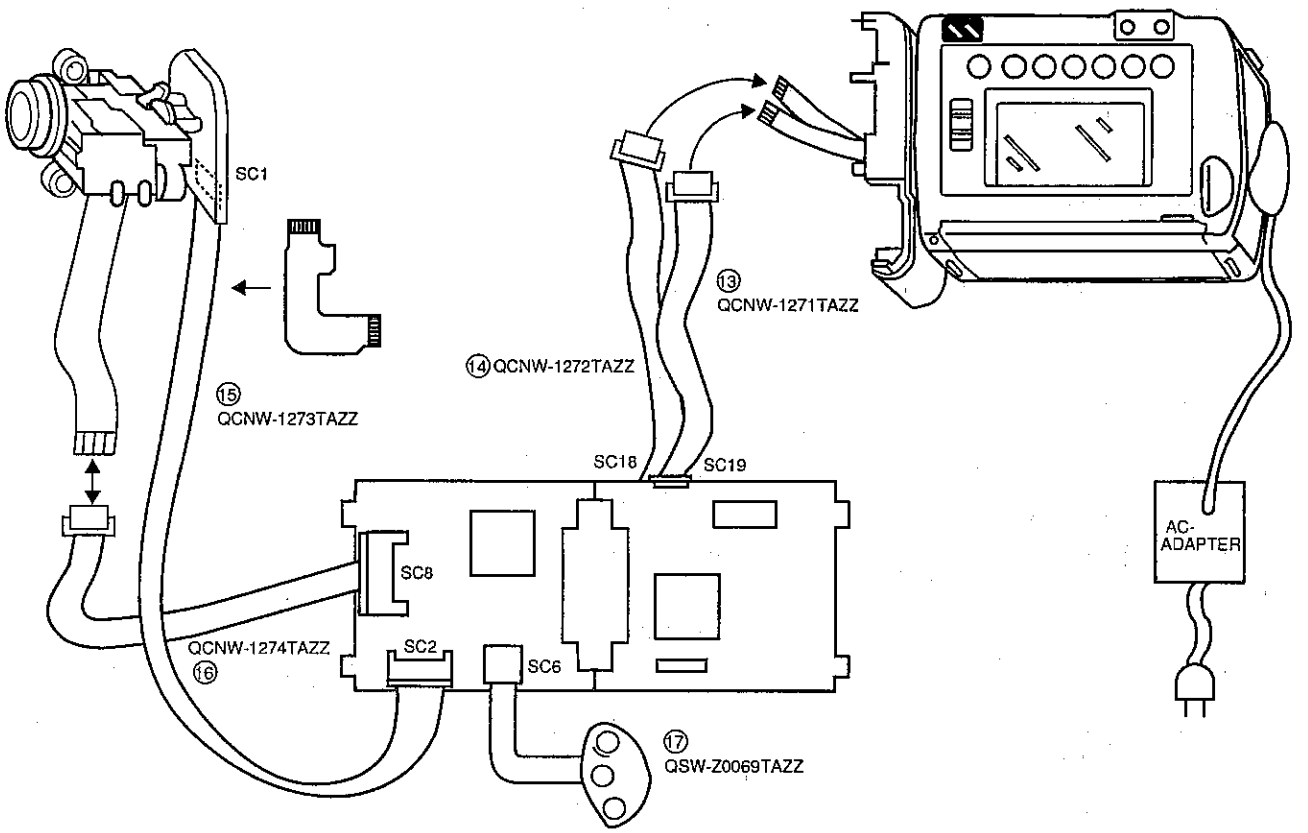
1) Set up the illumination of about 3000 lux that falls evenly over the entire test pattern. (Preferably prepare two or more light sources.) Adjust the color temperature to 3200 K.
2) With the camera at the WIDE lens position, the subject distance is short. Pay attention to give uniform illumination without any shadow on the subject.



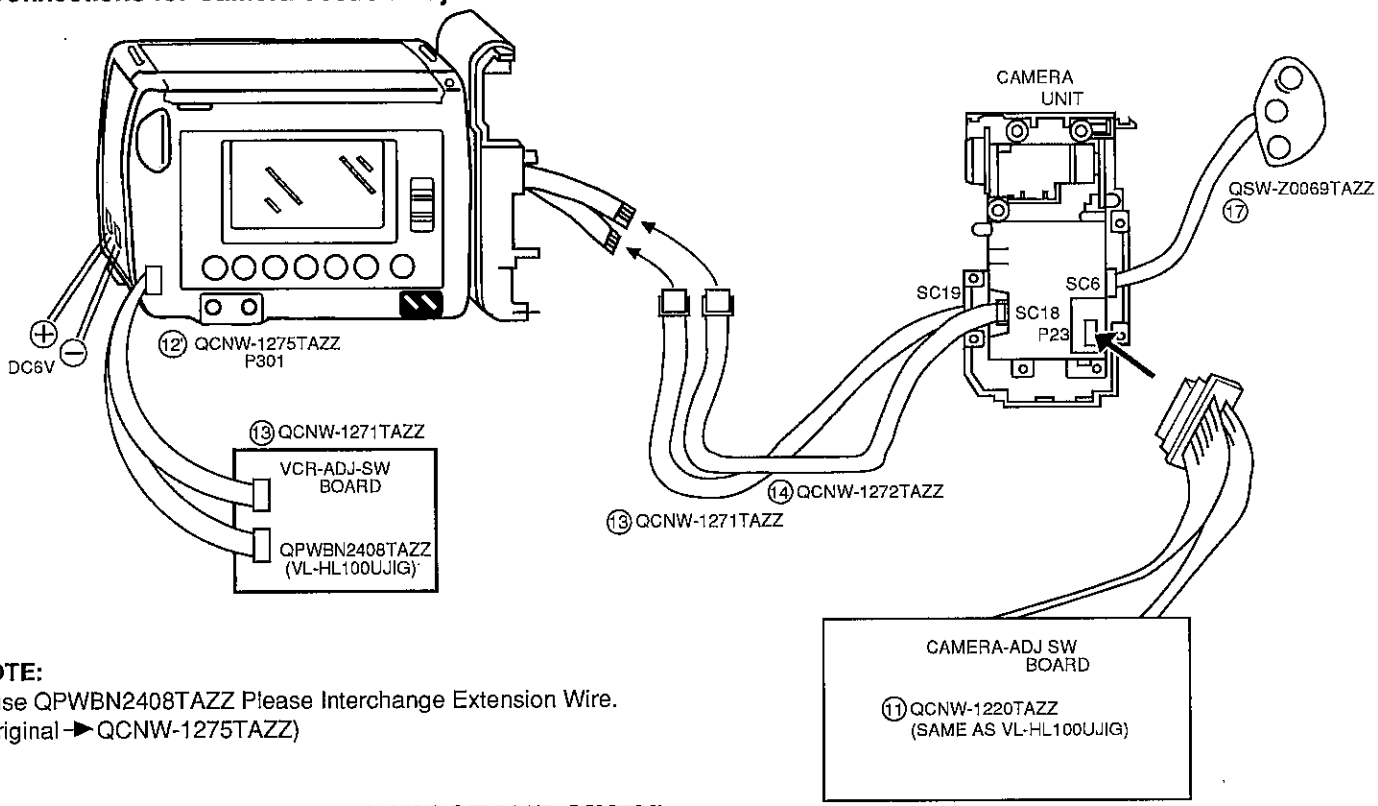
3) Use a new test pattern that is not dirty nor faded.
4) If the electrical circuitry is found faulty, pinpoint the trouble spot with an instrument and repair it before starting the adjustments.

(3) TYPICAL CONNECTIONS

• Connections for Camera Section Servicing



• **Connections for Camera Section Adjustment**

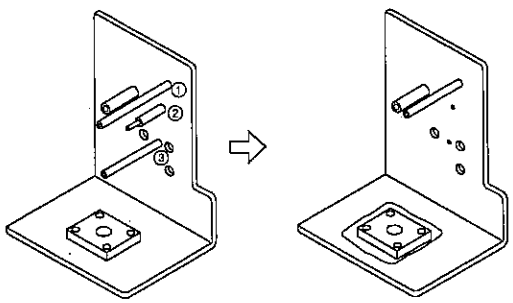


NOTE:
If use QPWBN2408TAZZ Please Interchange Extension Wire.
(Original ➡ QCNW-1275TAZZ)

(4) Camera servicing stand (JIGSTAND-MX7U)

When servicing the camera section on a tripod, use the dedicated stand (JIGSTAND-MX7U) that can be partially modified. How to modify the stand and set up the camera is discussed below.

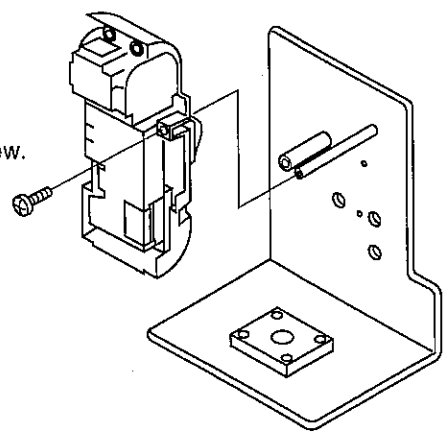
1) Modifying the camera stand (JIGSTAND-MX7U)



Procedure: 1) Remove the guide pins ①, ② and ③.
2) Attach the guide pin ③ to the guide pin ① position. (Note that the guide pins ① and ③ are different in length.)
3) Place a cloth or the like, about 1 mm thick, over the tripod mount. (This is to keep the cabinet from scratches.)

2) Setting up the camera

Use an M2, P=0.5 screw.



Note: Be careful not to overtighten the screw. The cabinet may get cracked.

7-2. ADJUSTMENT PROCEDURE

This adjusting procedure covers all the steps for conducting the adjustments all the way. There are some steps that may be skipped, depending on the specific needs for servicing and adjustment.

1. OFD voltage adjustment
   * Preparation: Set up the auto focus adjustment mode.
2. Auto focus adjustment [basic iris and lens adjustments]
   * Preparation: Set up the camera signal line adjustment mode.
3. Sync level adjustment
4. Iris AE adjustment
5. AGC adjustment
6. White balance rough adjustment
7. Carrier balance adjustment
8. Burst gain adjustment
9. White balance fine adjustment
10. Color gain adjustment
11. Auto white balance adjustment

* Before making the auto focus adjustment 2, set up the auto focus adjustment mode, referring to the steps below.
  To start the iris AE adjustment 4 and on, first set up the camera signal line adjustment mode, referring to the steps below.

• Setting up the auto focus adjustment mode

1. Set the power switch on the tool (QPWBF2450TAZZ) to the ON position.
2. Set all the other switches on the tools (QPWBF2450TAZZ and QCNW-1220TAZZ) to the OFF position. (Or make sure they are all at the OFF position.)
3. Set the LENS ADJ switch on the tool (QCNW-1220TAZZ) to the ON position.
4. Set the power switch on the tool (QPWBF2450TAZZ) to the CAMERA mode position.
5. Set the ADJ SW switch on the tool (QPWBF2450TAZZ) to the CAM ADJ position.
6. Now the camera section is in the auto focus adjustment mode.

• Setting up the camera signal line adjustment mode

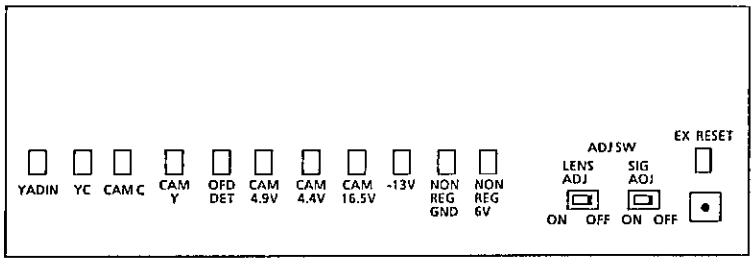
1. Set the power switch on the tool (QPWBF2450TAZZ) to the OFF position.
2. Set the above power switch to the CAMERA mode position.
3. Set all the other switches on the tools (QPWBF2450TAZZ and QCNW-1220TAZZ) to the OFF position. (Or make sure they are all at the OFF position.)
4. Call the manual focus mode.
5. Set the SIG ADJ switch on the tool (QCNW-1220TAZZ) to the ON position.
6. Press the RESET switch on the tool (QCNW-1220TAZZ).
7. Set the ADJ SW switch on the tool (QPWBF2450TAZZ) to the CAM ADJ position.
8. Now the camera section is in the camera signal line adjustment mode.

7-3. SETTING THE ADJUSTMENT MODES

Take the same steps as for the VCR adjustments. Refer to page 6-4.
NOTE: Never change any other address data than those to be adjusted.

7-4. ADJUSTING THE CAMERA SECTION

Location fo test points use the camera adjustment PWB (QCNW-1220TAZZ).



7-4-1. OFD voltage adjustment

• Rough adjustment

Measuring instrument	Digital voltmeter
Subject:	None
Tape:	—
Test point:	OFD
Adjustment address:	7B
Adjustment level:	CCD sensor's specified voltage ± 0.05 V

1) Get the camera ready to shoot.
2) Using the address 7B, roughly adjust the voltage at the OFD test point to the level shown on the back of the CCD sensor.
3) Using the address 7C, finely adjust the above voltage in the same way.

• Fine adjustment

Measuring instrument	Digital voltmeter
Subject:	None
Tape:	—
Test point:	OFD
Adjustment address:	7C
Adjustment level:	CCD sensor's specified voltage ± 0.05 V

7-4-2. Auto focus adjustment

Before starting this adjustment, set up the auto focus adjustment mode.

• Basic iris adjustment

Measuring instrument	None
Subject:	More than 10 m away
Tape:	—
Test point:	None
Adjustment address:	FE
Adjustment level:	01

1) Set up the auto focus adjustment mode.
2) Write the data 01 to the address FE. The following adjustments are automatically carried on; ① hall offset, ② iris offset and ③ iris close.

• Lens adjustment

Measuring instrument	None
Subject:	More than 10 m away
Tape:	—
Test point:	None
Adjustment address:	FF
Adjustment level:	01, 02, 03, 05, 07

1) Set up the auto focus adjustment mode.
(This is unnecessary after the above basic iris adjustment has been made.)
2) Make sure the pedestal level is 35 mV (± 10 mvp-p), if not, take the following adjustment steps a) thru c).
a) Write "03" to the adress "5F".
b) Adjust the set-up level to 35 mV at the address "75".
c) Write "BF" to the address "5F".
3) Write the adjustment data 01, 02, 03, 05 and 07 one after the other to the address FF. The adjustments are as follows.

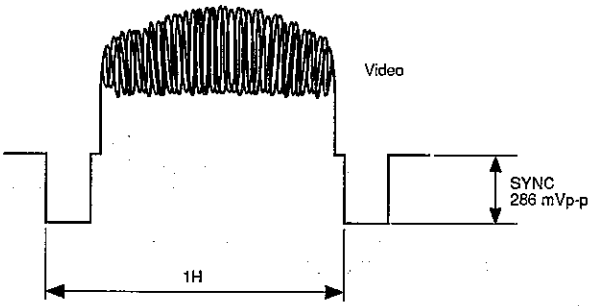
Data	Adjustment
01	AF noise level
02	Focus shielding plate
03	Zoom shielding plate
05	WIDE END ∞ position
07	TELE END ∞ position

7-4-3.

• Sync level adjustment

Measuring instrument	Oscilloscope
Subject:	Anything
Tape:	—
Test point:	CAM-Y
Adjustment address:	79
Adjustment level:	286 mVp-p

1) Get the camera ready to shoot.
2) Connect the oscilloscope to the CAM-Y test point on the adjustment PWB. Adjust the sync level to 286 mVp-p.

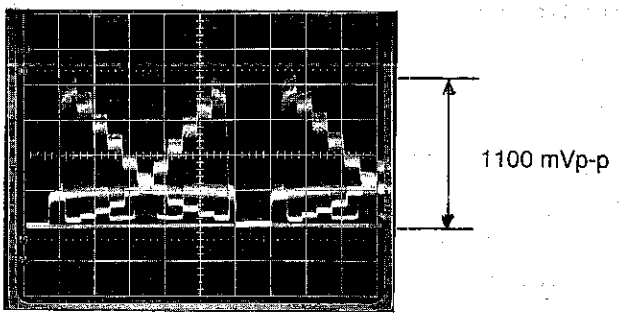


7-4-4.

• Iris AE adjustment

Measuring instrument	Oscilloscope
Subject:	Gray scale
Tape:	—
Test point:	YADIN
Adjustment address:	F6
Adjustment level:	1100 mVp-p

1) Set up the camera signal line adjustment mode.
2) Shoot the gray scale in the standard way. Observe the YADIN signal on the oscilloscope screen and rewrite the data of address F6 to get an amplitude of 1100 mVp-p as shown below.

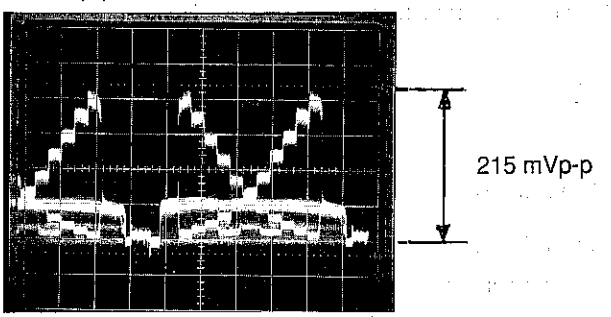


7-4-5.

• AGC adjustment

Measuring instrument	Oscilloscope
Subject:	Gray scale
Tape:	—
Test point:	YC
Adjustment address:	F7
Adjustment level:	215 mVp-p

1) Rewrite the data of address F7 to get an amplitude of 215 mVp-p as shown below.

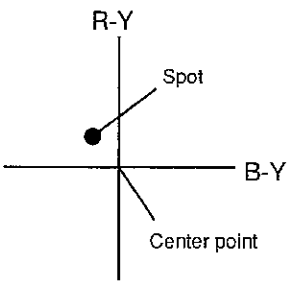


7-4-6.

• White balance rough adjustment

Measuring instrument	Vector scope
Subject:	Gray scale
Tape:	—
Test point:	VIDEO OUT
Adjustment address:	G-GAIN 50, B-GAIN 51
Adjustment level:	0 ± 5 %

1) Adjust the spot of addresses 50 and 51 (R and B) to the center point on the vector scope.



7-4-7.

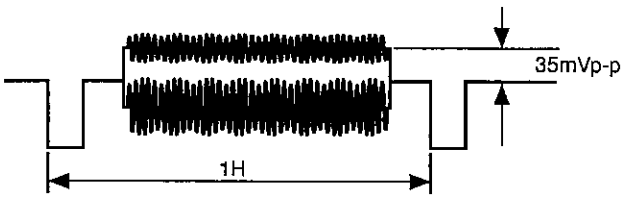
Carrier balance adjustment

*Take the following steps; Set-up, carrier balance ①, carrier balance ②, and set-up.

• Pedestal control (set-up) adjustment

Measuring instrument	Oscilloscope
Subject:	None
Tape:	—
Test point:	CAM-Y
Adjustment address:	75
Adjustment level:	35 mVp-p

1) Make sure the data of addresses 0E and 0F are 03 or FF.
2) Write the data 03 to the address 5F.
3) Using the address 75, adjust the pedestal level to 35 mVp-p.



• Carrier balance ① adjustment

Measuring instrument	Vector scope
Subject:	None
Tape:	—
Test point:	VIDEO OUT
Adjustment address:	0E, 0F
Adjustment level:	0 ± 5 %

1) Write the data 3F to the address 3E.
2) Using the address 0E or 0F, adjust the spot to the center point of the vector scope. (The data should be more than 03 for both the addresses.)

• Carrier balance ② adjustment

Measuring instrument	Vector scope
Subject:	None
Tape:	—
Test point:	VIDEO OUT
Adjustment address:	3F
Adjustment level:	0 ± 5 %

1) Write the data FB to the address 5F.
2) Using the address 3F, adjust the spot to the center point of the vector scope.
3) Write the data "03" to the address "FE".
4) Using the address "1B", adjust the spot to the center point of the vector scope.
5) Write the data "FF" to the address "FE".
6) Write the data 03 to the address 5F.
7) Write the data FF to the address 3E.

↓

Finally make the set-up adjustment again.

1) Using the address 75, adjust the pedestal level to 15 mVp-p.
2) Write the data BF to the address 5F.

↓

Now the carrier balance and set-up adjustments are complete.

7-4-8.

• Burst gain adjustment

Measuring instrument	Oscilloscope
Subject:	None
Tape:	—
Test point:	CAM-C
Adjustment address:	59
Adjustment level:	286 mVp-p

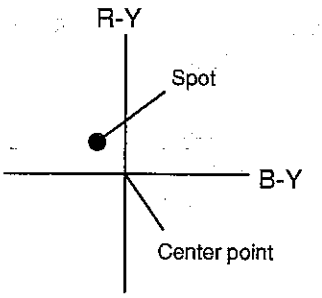
1) Measure the burst signal level on the oscilloscope. Using the address 59, adjust the burst amplitude to 286 mVp-p.

7-4-9.

• White balance adjustment

Measuring instrument	Vector scope
Subject:	Gray scale
Tape:	—
Test point:	VIDEO OUT
Adjustment address:	R-GAIN 50, B-GAIN 51
Adjustment level:	0 ± 5 %

1) As in the above adjustment 6, adjust the spot of the addresses 50 and 51 (R and B) to the center point of the vector scope.

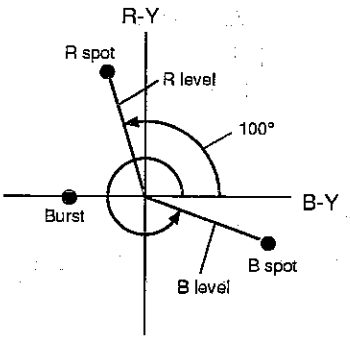


7-4-10.

• Color gain adjustment

Measuring instrument	Vector scope
Subject:	Color bar chart
Test point:	VIDEO OUT
Adjustment address:	R-Y GAIN 53 B-Y GAIN 54 R-Y MAT 56 B-Y MAT 57
Adjustment level:	R-Y GAIN; Burst ratio 1.8 ± 0.1
	B-Y GAIN; Burst ratio 1.2 ± 0.1
	B-Y MAT; 100 ± 2°
	R-Y MAT; 341 ± 2°

1) Using the address 53, adjust the R level to a burst ratio of 1.8. With the address 54, adjust the B level to a burst ratio of 1.2.
2) Using the address 57, adjust the R phase to 100°. With the address 56, adjust the B phase to 341°.
3) Repeat the above steps 1) and 2).

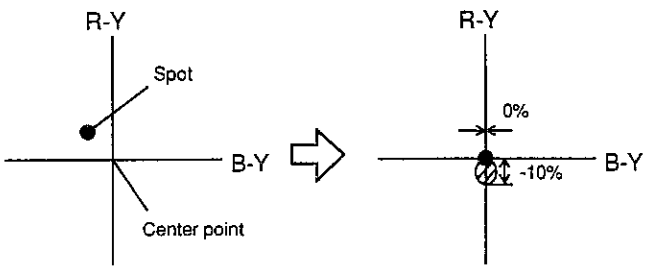


7-4-11.

• Auto white balance adjustment

Measuring instrument	Vector scope
Subject:	Gray scale
Test point:	VIDEO OUT
Adjustment address:	R-OUT DOOR 4F B-OUT DOOR 55
Adjustment level:	R-OUT DOOR; -10 ± 5 % B-OUT DOOR; 0 ± 5 %

1) Attach the color temperature conversion filter (JIGHOYA-LB165) to the front of the lens.
2) Using the addresses R-OUT DOOR 4F and B-OUT DOOR 55, adjust the spot to the R-Out door -10%, B-Out door 0%.



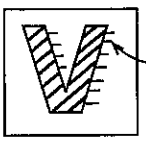
3) Take off the color temperature conversion filter.
4) Turn off the SIG ADJ switch and press the RESET switch. The signal adjustment mode is now cleared.

OK

8. TROUBLESHOOTING

8-1. Classification of troubles

No function at all	YES	Check the DC/DC converter circuit and power circuit.
No tape ejection	YES	Check the system controller and loading motor circuit.
No LCD light-up	YES	Check the inverter transformer and DC/DC converter circuit.
No picture in EE mode	YES	* Check the camera section, Y/C circuit and LCD circuit.
No picture playback	YES	Check the Y/C circuit and head amplifier circuit.
No video recording	YES	Check the Y/C circuit and head amplifier circuit.
Streaking at self-recording/playback	YES	Check the Y/C circuit and head amplifier circuit.



Noises at regular intervals in playback	YES	Check the servo circuit.
No recorded characters on screen	YES	Check the LCD circuit and character generator (IC704).
No color in EE mode	YES	* Check the camera section and Y/C circuit.
No color in playback	YES	Check the Y/C circuit and head amplifier circuit.
No color in recording	YES	Check the Y/C circuit and head amplifier circuit.
No sound	YES	Check the audio circuit.
Error message (e.g. E007)	YES	Check the system controller and servo circuit.

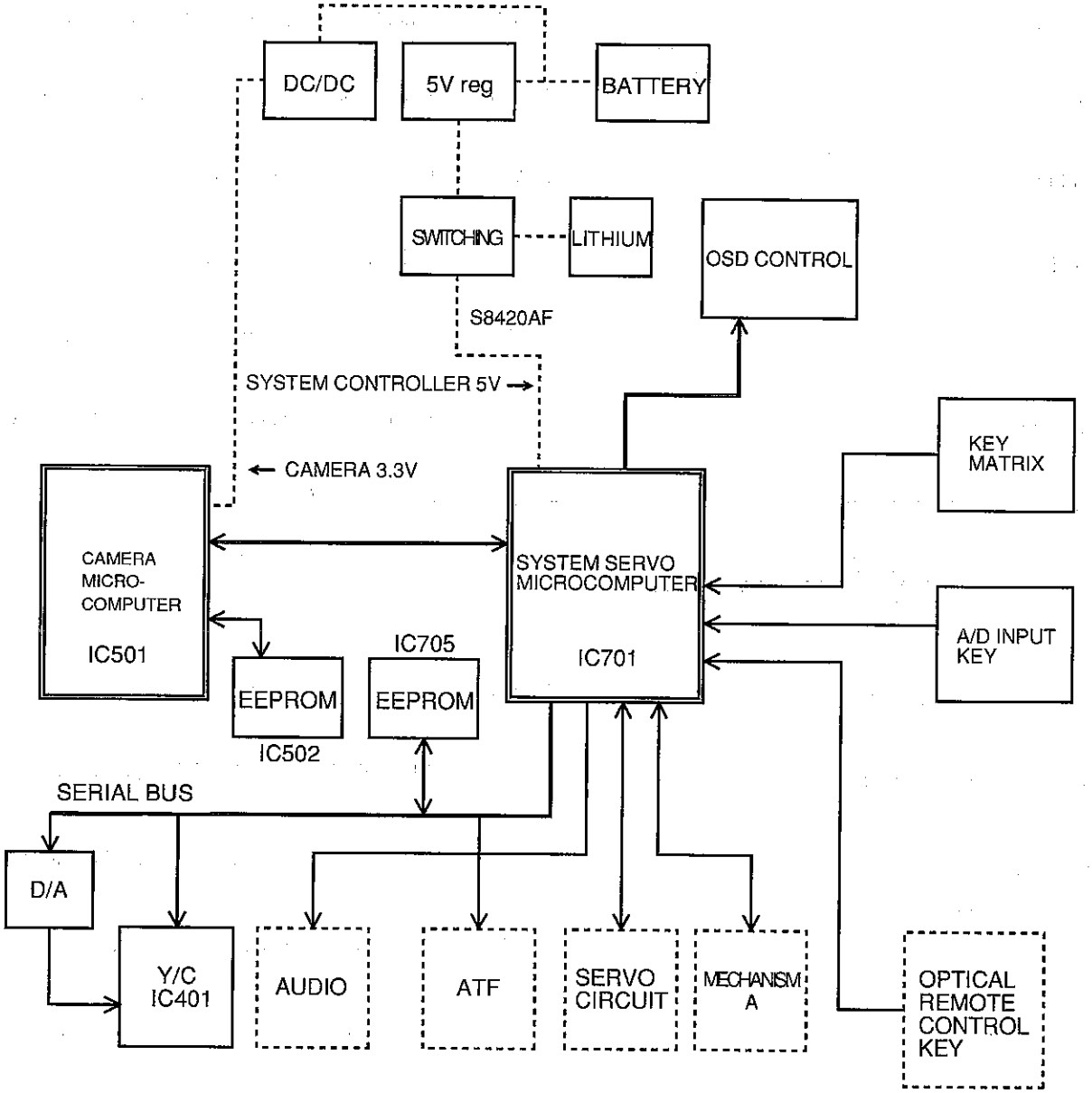
Normal

8-2. Troubleshooting for the camera section

No picture	YES	Check the auto iris circuit (IC553) and main signal line.
No color	YES	Check IC201 (DSP), IC241 (D/A) and their peripherals.
No auto white balance function	YES	Check IC501 (camera CPU) and its peripherals.
No auto focus function	YES	Check IC501, IC552 and their peripherals.
No power zoom function	YES	Check IC501, IC554 and their peripherals.

Normal

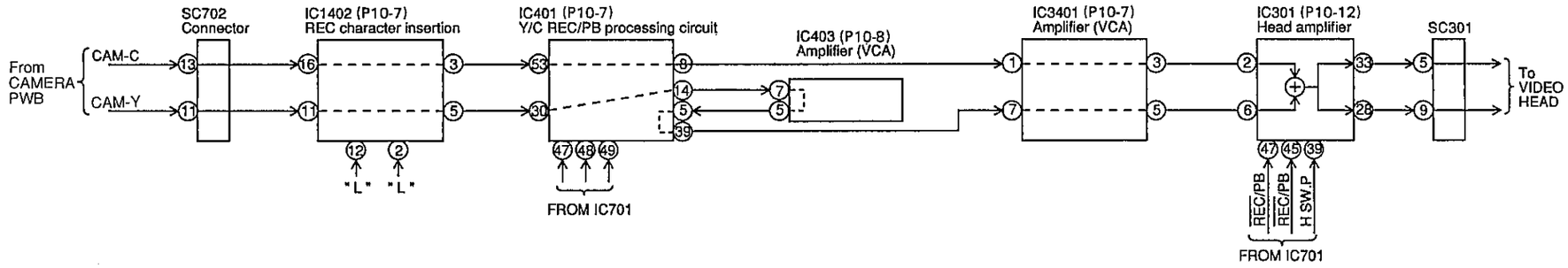
9. SYSTEM BLOCK DIAGRAM



* On this model, all the circuits of the VCR and camera sections are controlled by IC701 and IC501.
  1) IC501 and IC401 are controlled with the serial data from IC701.
  2) IC705 is a memory that serves to store the adjustment data of the VCR section.
  3) IC502 is a memory that serves to store the adjustment data of the camera section.
  4) The other circuits and ICs are under the L/H level or the PWM control.

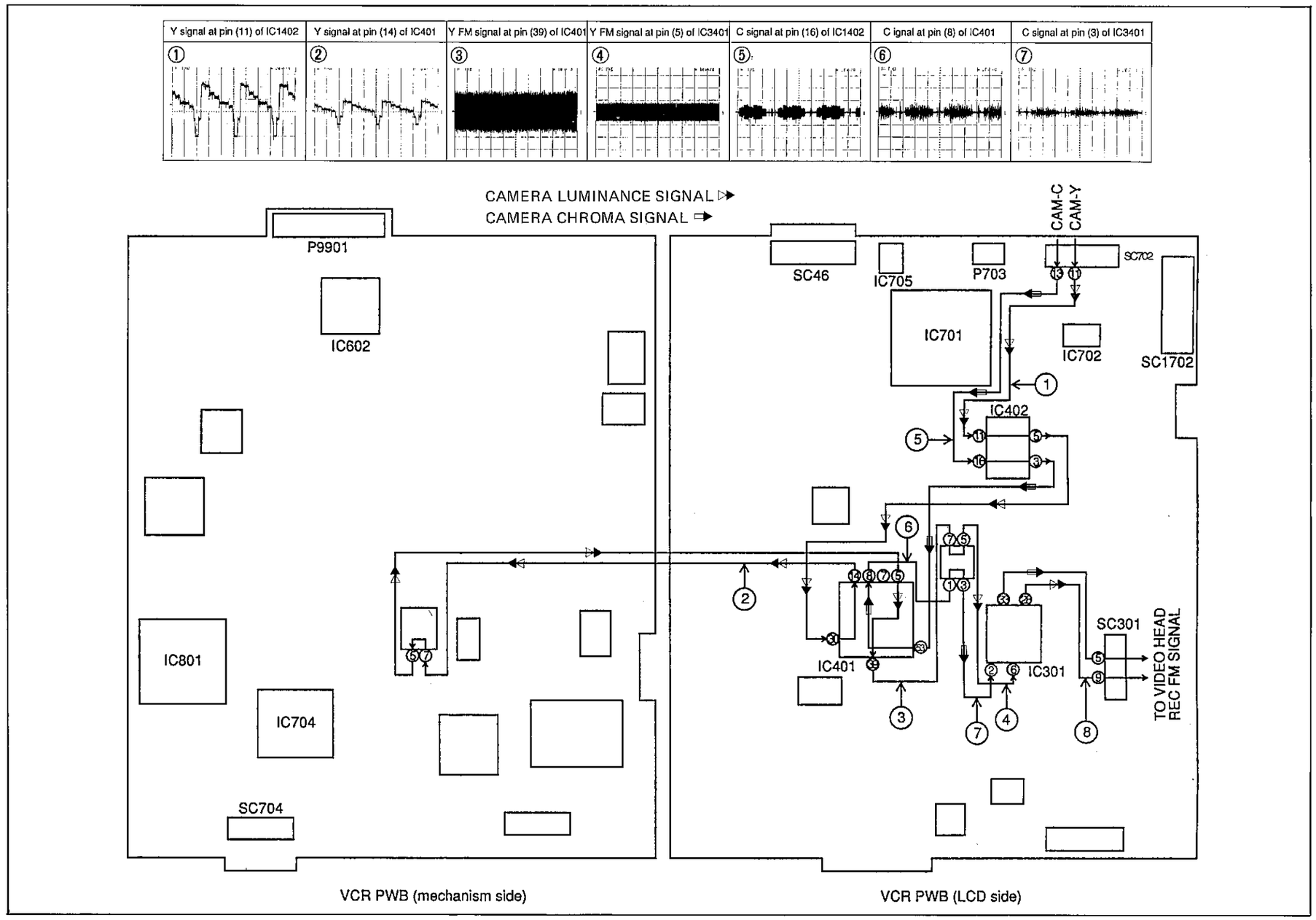
9-1. VCR SECTION BLOCK DIAGRAM Y/C recording system signal flow

* The numbers in parentheses in the block diagram denote the page numbers of the related wiring diagrams.



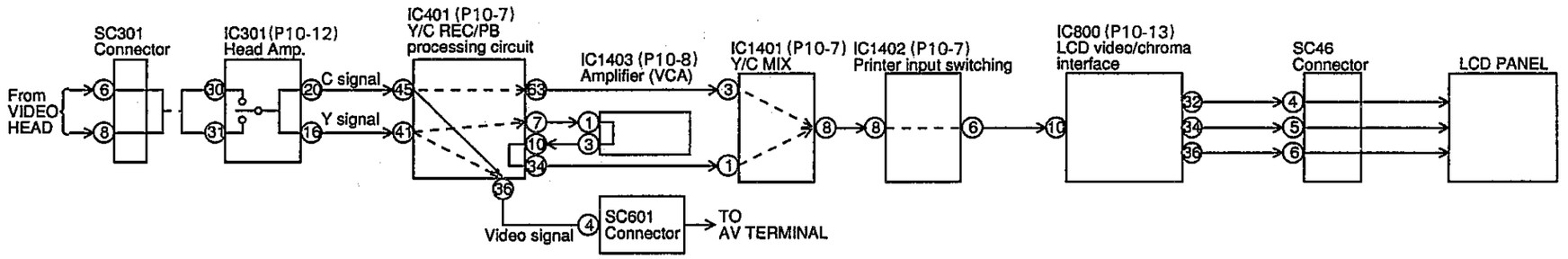
*** Main signal flow**

1) The CAM Y/C signal is fed from the camera PWB to the connector SC702.
2) IC1402 is used to insert the recording characters.
3) IC401 is used to convert the Y signal to the FM signal and the C signal to the low-frequency conversion color signal. The FM and color signals are fed out of pins 39 and 8, respectively.
4) IC304 is used to control the VCA (voltage control amplifier) to a suitable level.
5) IC301 is a head amplifier to mix the Y, C, audio and ATF signals. With the head switching pulse, the signal is switched to the heads.



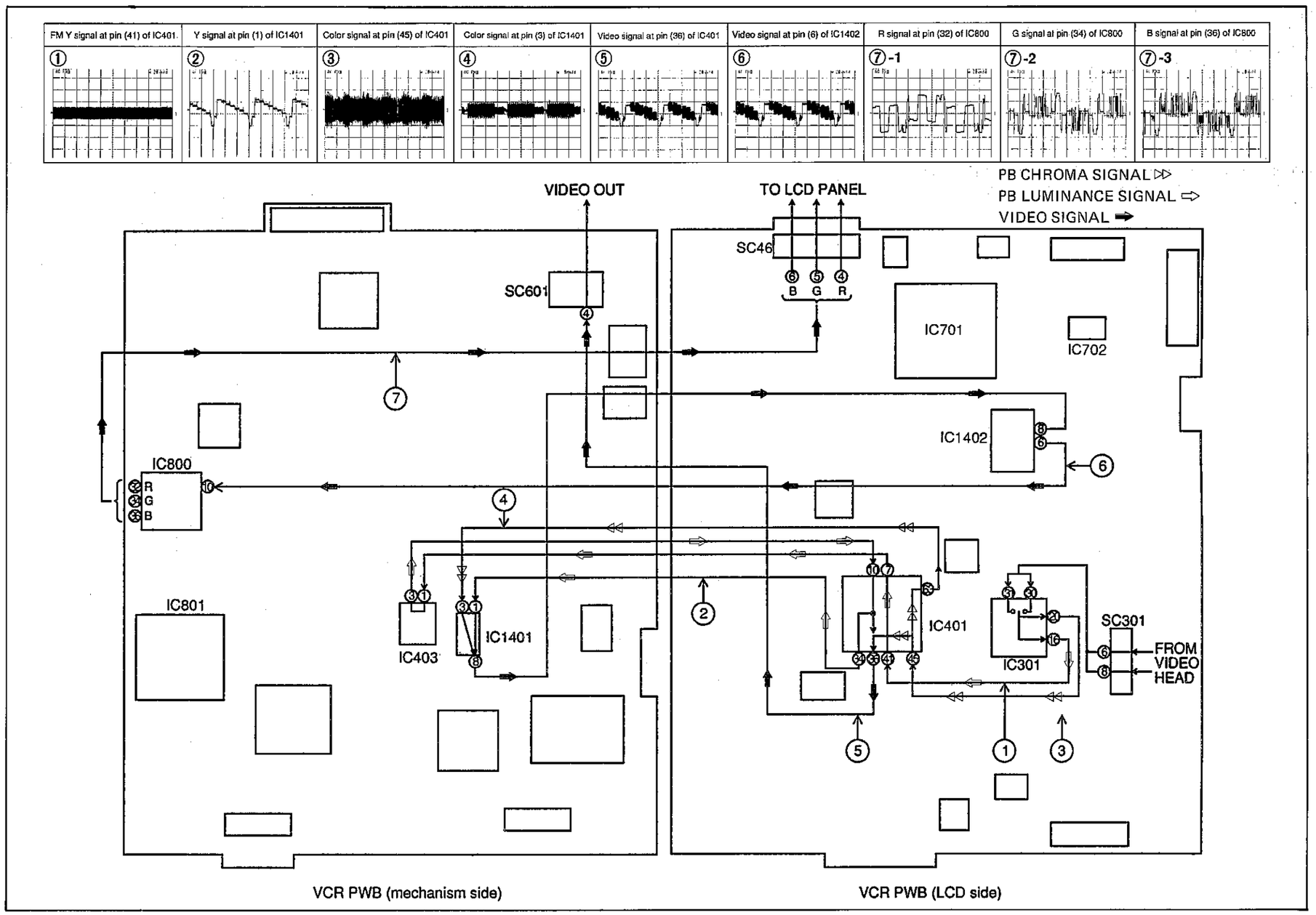
9-2. VCR SECTION BLOCK DIAGRAM Y/C playback signal flow

* The numbers in parentheses in the block diagram denote the page numbers of the related wiring diagrams.



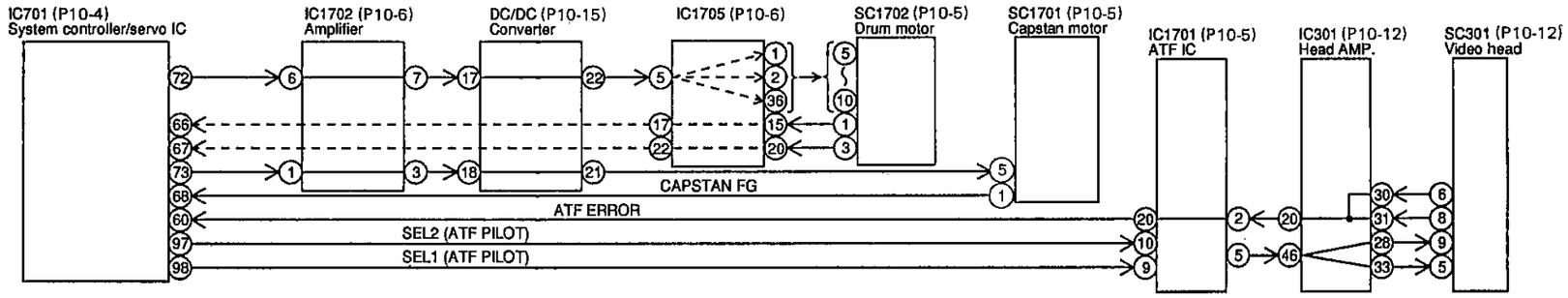
*** Main signal flow**

1) The signals from the heads are fed into IC301 (head amplifier).
2) In IC301, the head signals is alternately switched with the head switching pulse. The C and Y signals are fed out of pins 20 and 16, respectively.
3) • In IC401, the FM Y signal is demodulated to the original Y signal and the low-frequency conversion color signal is converted to the original 3.58-MHz color signal.
   • The output to the AV terminal is fed out of pin 36 as the video signal.
   • The C and Y signals are fed into pins 36 and 34, respectively, of the LCD panel.
4) IC1401 is used to mix the Y and C signals.
5) IC1402 is used to select the video signal for the LCD panel. With pin 7 at "L" level, the playback video signal is given; at "H" level, the printer input signal is given.
6) IC800 is a video/chroma interface for the LCD TV set. The R, G and B signals are made from the video signal and inverted every 1H.



9-3. VCR SECTION BLOCK DIAGRAM Drum/capstan servo system signal flow

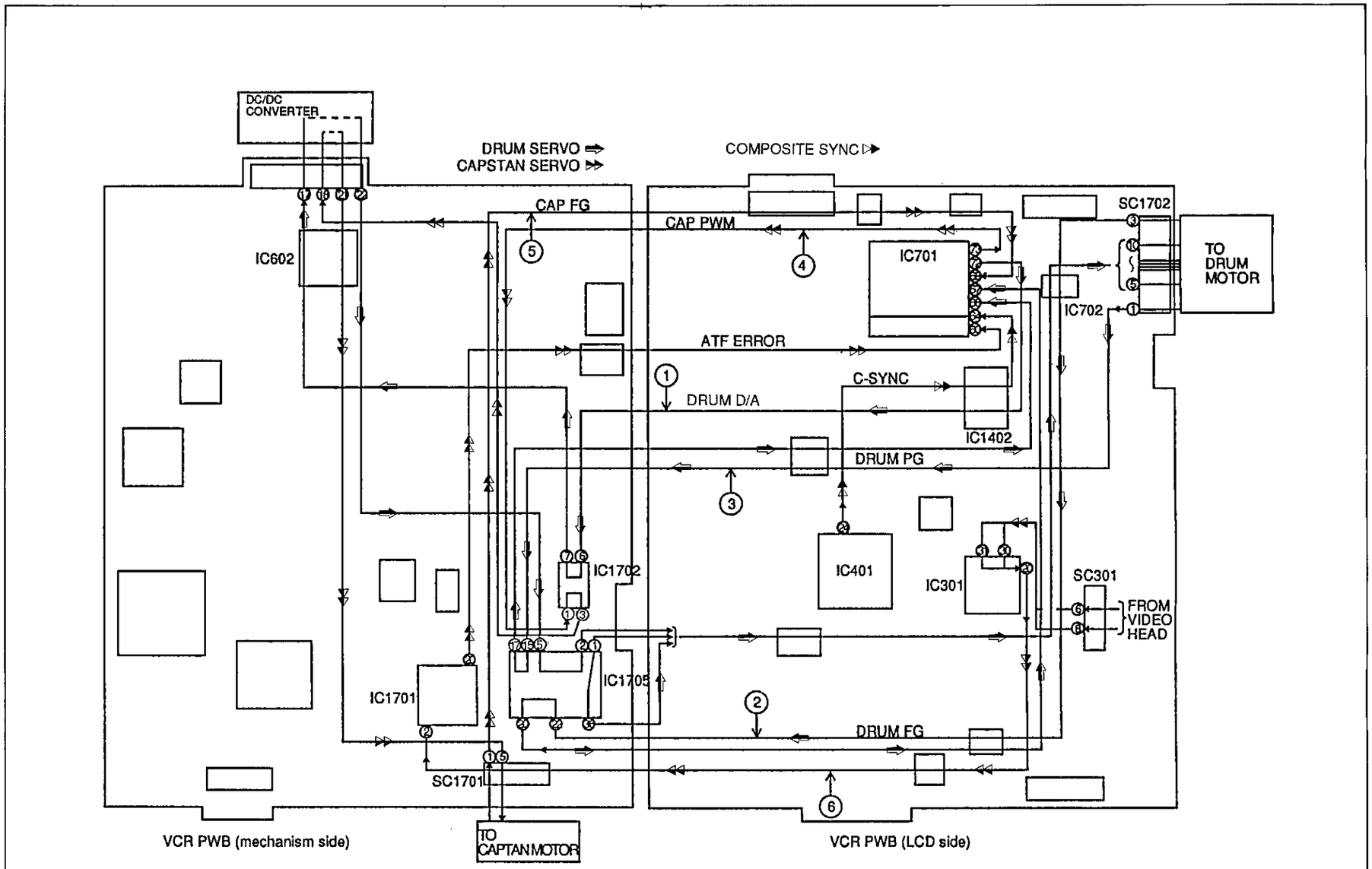
* The numbers in parentheses in the block diagram denote the page numbers of the related wiring diagrams.



*** Main signal flow**

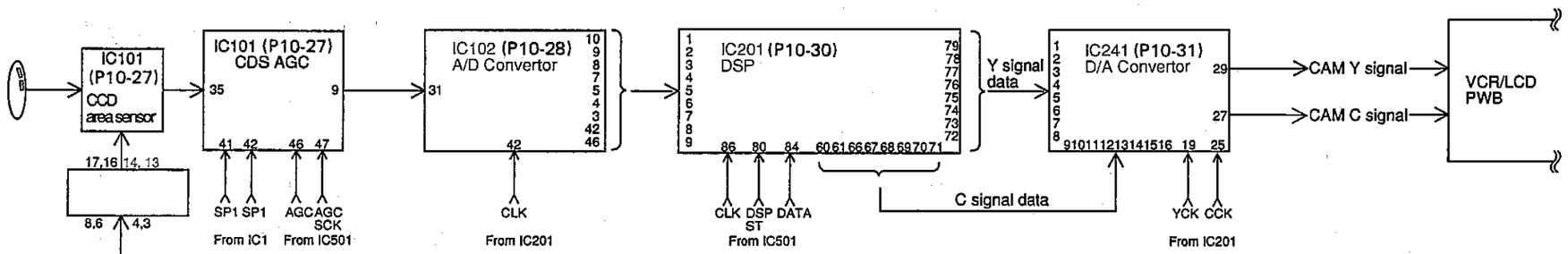
1) IC701 is used to carry on system control and servo control.
2) The DC/DC converter converts the control signal up to the level enough to drive the drum motor and the capstan motor.
3) IC1705 is used to convert the signal to the 3-phase current signal to drive the drum motor and to amplify the drum FG and drum PG signals.
4) IC1701 is used to generate and amplify the ATF pilot signal.
5) IC301 is used to mix the ATF pilot signal and the video signal.

IC701 (72) DRUM D/A	IC705 (20) DRUM FG	IC705 (15) DRUM PG
①	②	③
IC701 (73) CAP PWM	IC701 (68) CAP FG	IC1701 (2) ATF
④	⑤	⑥
ATF ERROR		
⑦		



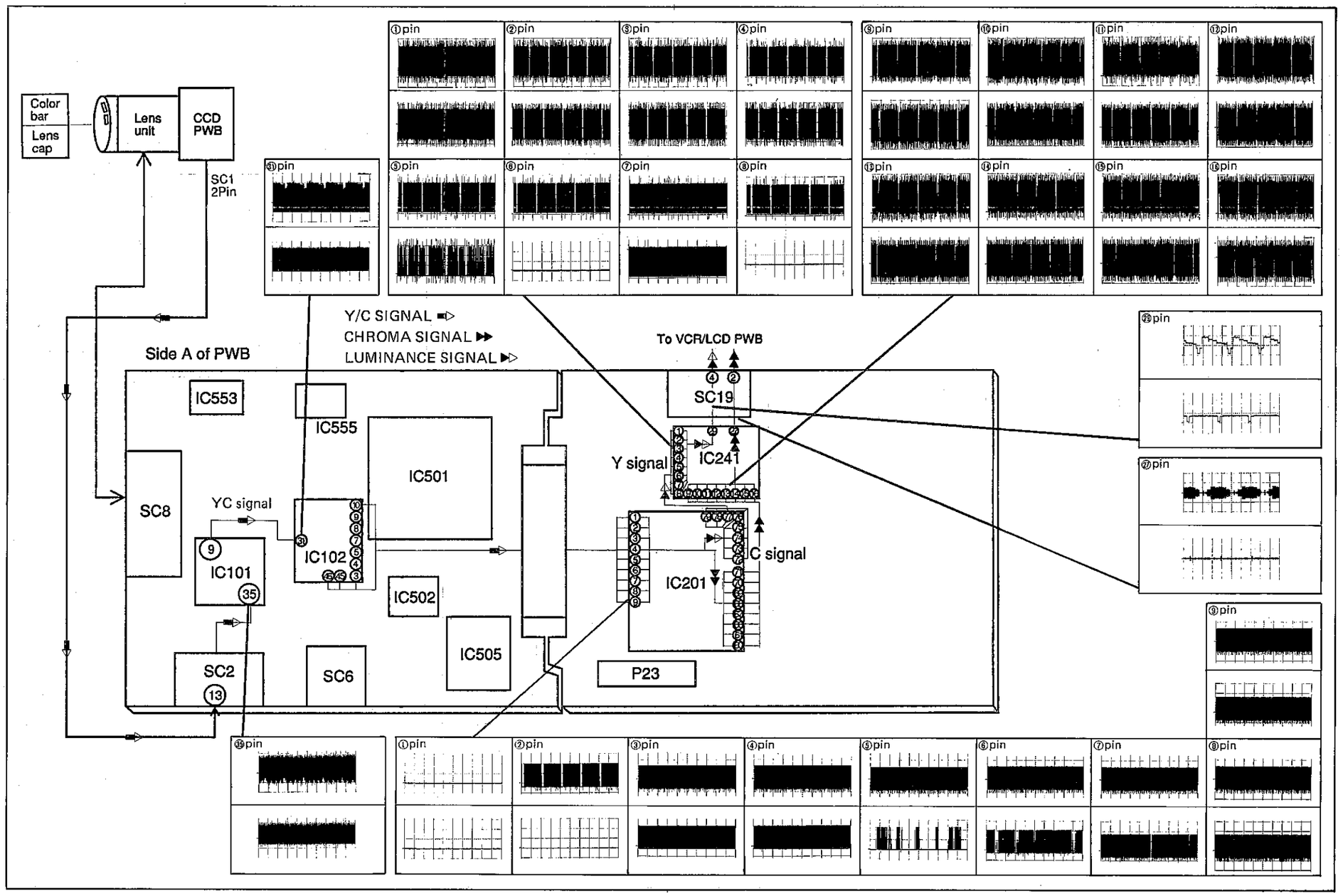
9-4. CAMERA SECTION BLOCK DIAGRAM Camera signal flow

* The numbers in parentheses in the block diagram denote the page numbers of the related wiring diagrams.



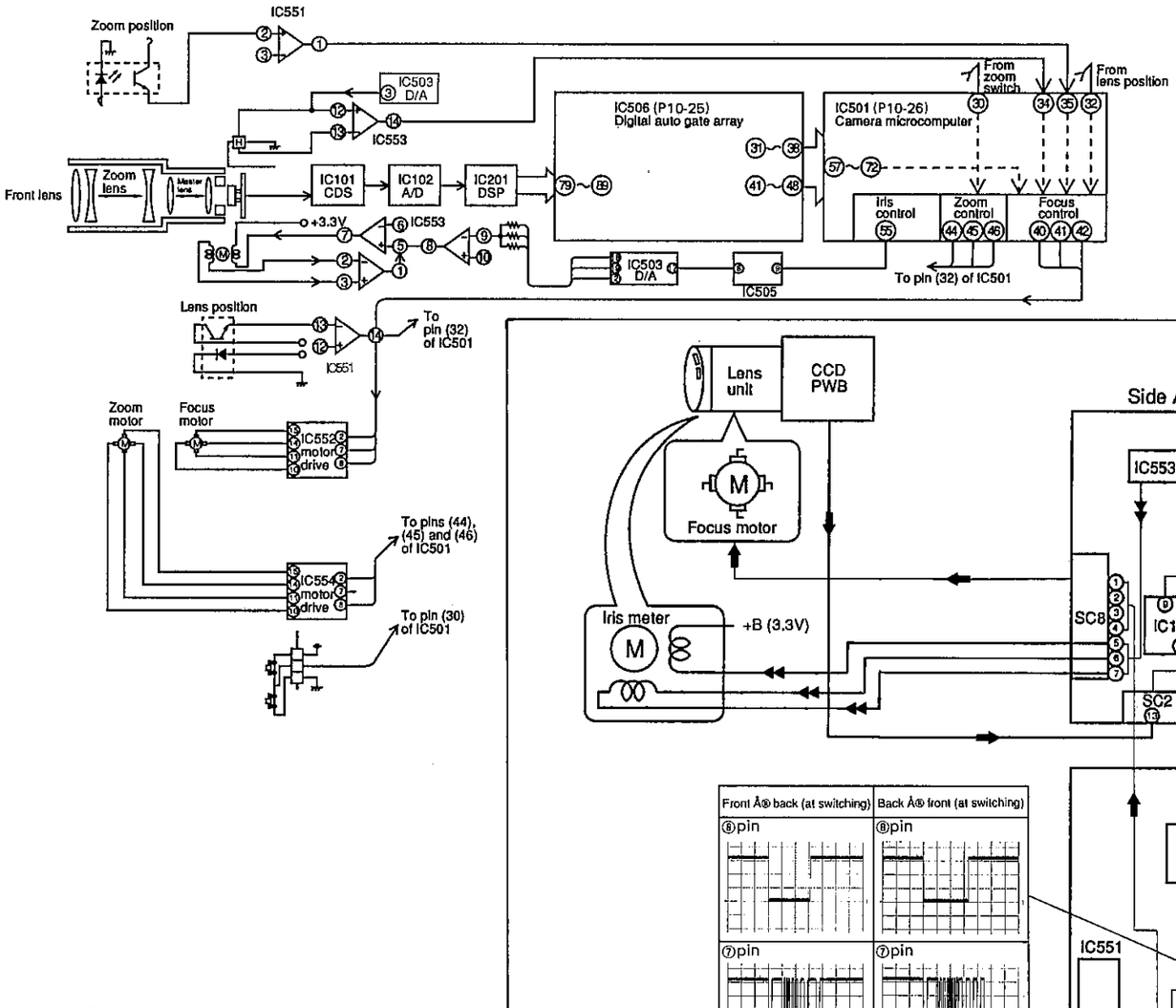
*** Main signal flow**

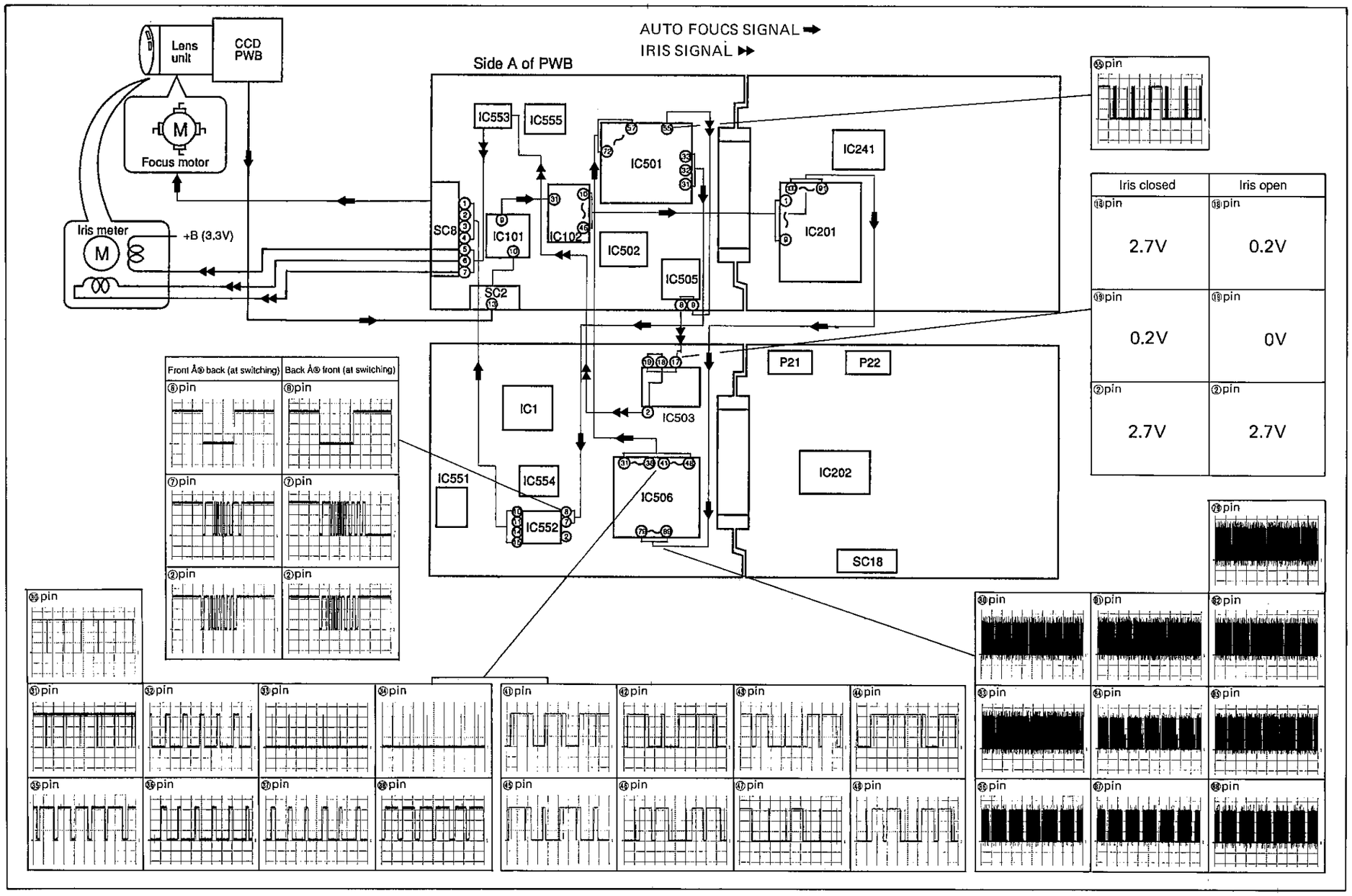
1) The photoelectric conversion is made by the CCD and the Y and C components are picked up.
2) Dual correlation sample holding and AGC processing are carried out in IC101.
3) The analog Y and C signals are converted by IC102 into the digital data.
4) Y/C separation, detail enhancing, gamma correction and other digital processing are carried on in IC201. The Y and C data are independently outputted.
5) The Y and C data are converted by IC241 again into the analog signals.



9-5. CAMERA SECTION BLOCK DIAGRAM Lens drive signal flow

* The numbers in parentheses in the block diagram denote the page numbers of the related wiring diagrams.





*** Focus signal flow**

1) The DSP signal, which serves as the focus signal, is outputted to IC506.
2) In IC506, the low- and high-frequency components of the signal are detected.
3) The focus motor control signal is fed from IC501 to IC552.

*** Iris signal flow**

1) The DSP signal, which serves as the iris signal, is outputted to IC506.
2) In IC506, the signal is detected under neuro logic.
3) The detected data is computed in IC506 and the resulting signal goes out of pin 55.
4) The data signal is converted to analog voltage in IC503 in order to control the iris meter.

*** Zoom signal flow**

1) When the zoom switch is pressed, pin (30) of IC501 receives the input voltage.
2) The control signal from IC501 is fed to IC554 (motor drive) to control the zoom motor.

10-1. GENERAL SCHEMATIC DIAGRAM

CCD PWB
DUNTK4674HE01

REC S/S SW
ZOOM SW
QSW-Z0069TAZZ

LCD PANEL
RLCDV0009TAZZ

LI BATTERY
PWB
DUNTK4676HE00

SYSTEM TERMINAL
QTANZ0051TAZZ

INVERTER TRANS
UNIT RUNTK0290TAZZ
LAMP
KLMPV0007TAZZ

DC/DC CONVERTER
DUNTK4678HE01

QCNW-1233TAZZ

SENSOR

MICOM

CAMERA PWB
DUNTK2409PM01

SYSCON

AUD/POW

VCR PWB
DUNTK4673HE01

DMECV0001TA01
CAPSTAN MOTOR

MECHA INTERCONNECTION
PWB
DUNTK4677HE00

REEL SENSOR

MODE SW

DRUM MOTOR

LOADING MOTOR

HEAD

LENS UNIT
CLNS-0118TA01
FOCUS MOTOR
ZOOM POSI
ZOOM MOTOR
MASTER LENS POSI
IRIS METER
HALL DEVICE

SPEAKER UNIT
VSP0028P-27YB

LCD TURN SW
QSW-Z0065TAZZ

MENU KEY UNIT
QSW-Z0068TAZZ

REMOCON & POWER SW UNIT
RRMCK0003TAZZ

VCR OPE UNIT
QSW-Z0062TAZZ

MIC AMP
PWB
DUNTK4675HE00

MIC UNIT
RMICC0053TAZZ

EAR PHONE & EXT MIC
JACK UNIT
QJAKZ0003TAZZ

EXT MIC

EAR PHONE

VTR ADJ

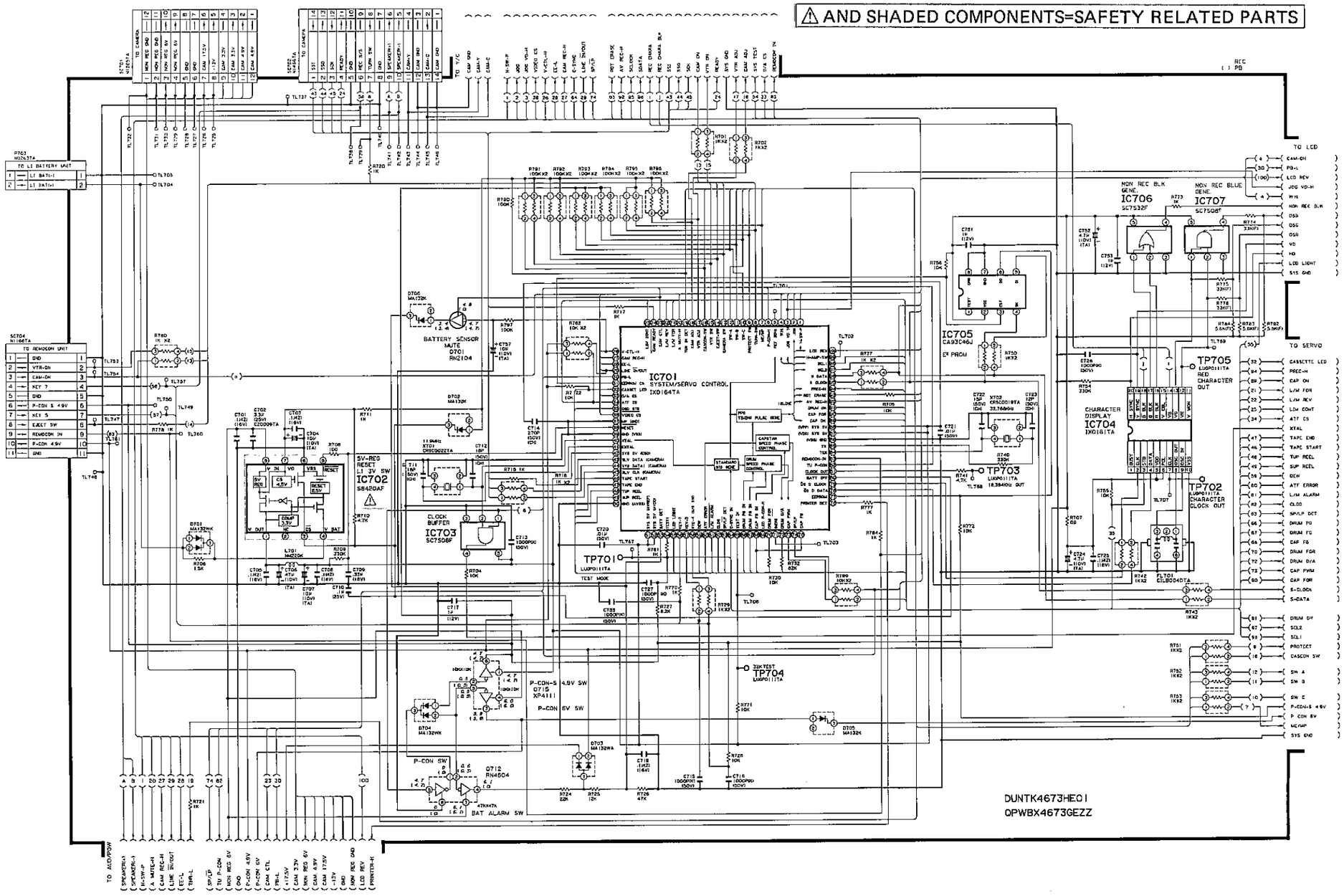
CAMERA ADJ

SERVO

HEAD AMP

10-2. SYSTEM CONTROL CIRCUIT SCHEMATIC DIAGRAM

⚠ AND SHADED COMPONENTS=SAFETY RELATED PARTS



*VOLTAGE MEASUREMENT MODE
PB . . . .Parentheses ( )
REC . . .Without parentheses

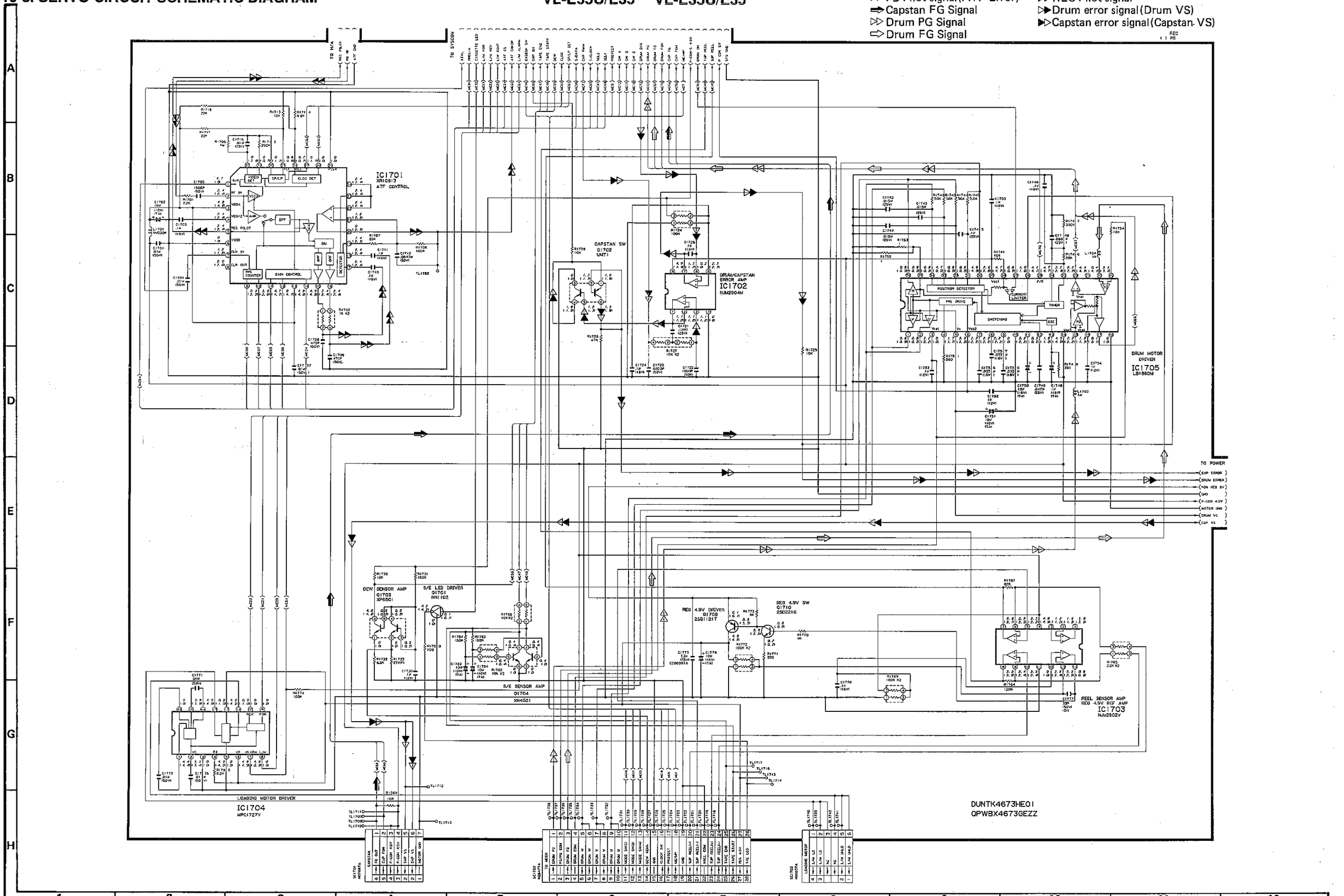
10-3. SERVO CIRCUIT SCHEMATIC DIAGRAM

VL-E30U/C VL-E35U/E35

VL-E30U/C VL-E35U/E35

▶▶ PB Pilot signal(ATF Error)
➡ Capstan FG Signal
▷▷ Drum PG Signal
⇨ Drum FG Signal

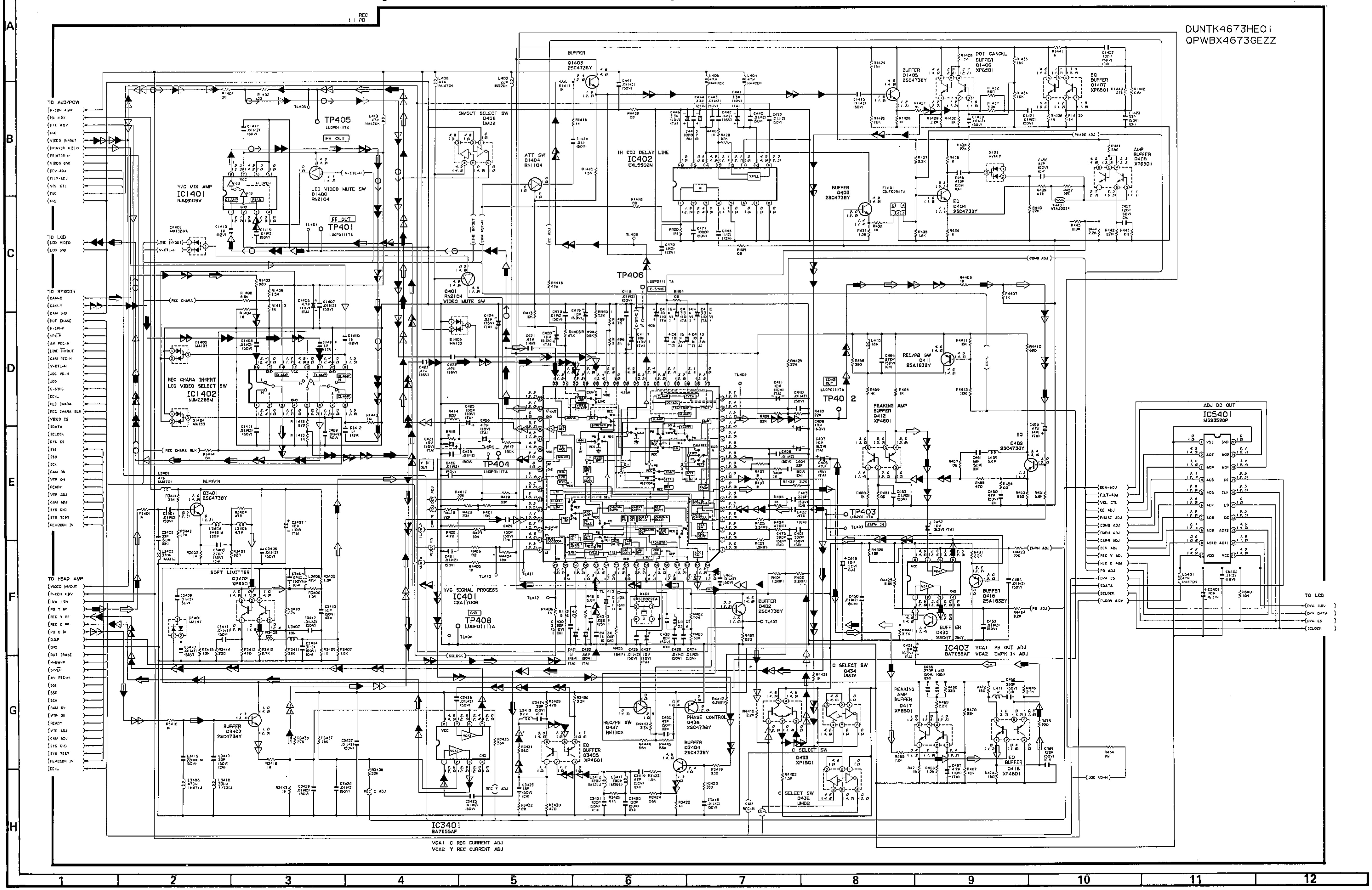
▶▶ REC Pilot signal
▷▷ Drum error signal(Drum VS)
▶▷ Capstan error signal(Capstan VS)



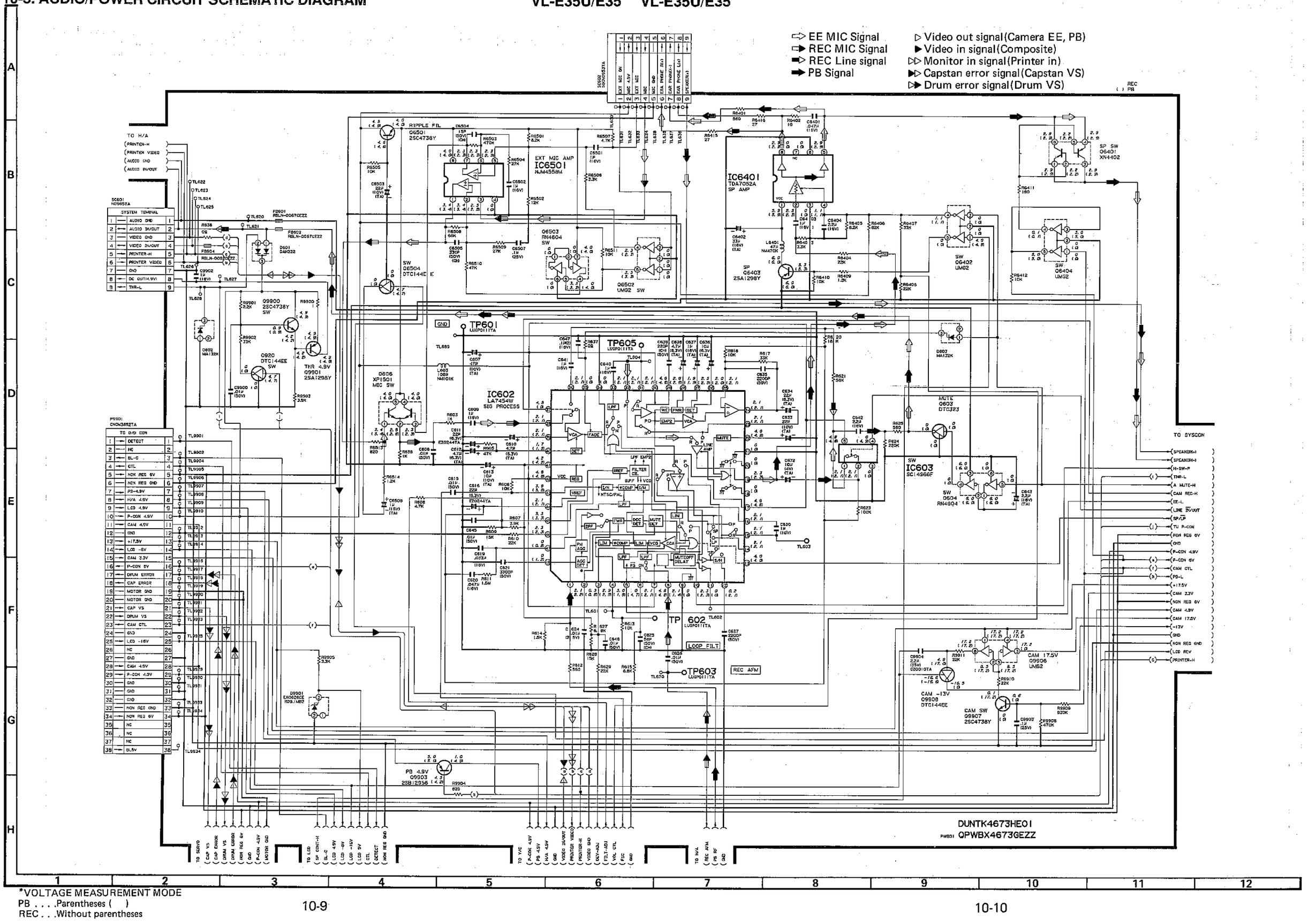
*VOLTAGE MEASUREMENT MODE
PB . . . .Parentheses ( )
REC . . .Without parentheses

10-4. Y/C CIRCUIT SCHEMATIC DIAGRAM

- CAM Y REC Signal
- CAM C REC Signal
- AV IN REC Y Signal
- AV IN REC C Signal
- PB Y Video out signal
- PB C Video out signal
- CAM Y Video out signal
- CAM C Video out signal
- PB Y LCD Video signal
- PB C LCD Video signal
- CAM Y LCD Video signal
- CAM C LCD Video signal
- Composite(Monitor in)
- Composite(Video in)


DUNTK4673HE01
QPWBX4673GEZZ
TO AUD/POW
TO LCD
TO SYSCON
TO HEAD AMP
Y/C MIX AMP
IC1401
NJM2509V
LCD VIDEO MUTE SW
Q1408
RN2104
TP405
TP401
REC CHARA INSERT
LCD VIDEO SELECT SW
IC1402
NJM2285M
BUFFER
Q1403
2SC4738Y
IN/OUT SELECT SW
Q406
UMD2
ATT SW
Q1404
RN1104
1H CCD DELAY LINE
IC402
CXL5502N
TP406
Q401
RN2104
VIDEO MUTE SW
BUFFER
Q1405
2SC4738Y
DOT CANCEL
BUFFER
Q1406
XP6501
EQ
BUFFER
Q1407
XP6501
BUFFER
Q403
2SC4738Y
EQ
Q404
2SC4738Y
AMP
BUFFER
Q405
XP6501
REC/PB SW
Q411
2SA1832Y
TP402
PEAKING AMP
BUFFER
Q412
XP4601
EQ
Q409
2SC4738Y
TP403
Y/C SIGNAL PROCESS
IC401
CXA1700R
TP404
TP408
BUFFER
Q402
2SC4738Y
ADJ DC OUT
IC5401
M62352GP
BUFFER
Q3401
2SC4738Y
SOFT LIMITTER
Q3402
XP6501
BUFFER
Q3403
2SC4738Y
IC3401
BA7655AF
VCA1 C REC CURRENT ADJ
VCA2 Y REC CURRENT ADJ
EQ
BUFFER
Q3405
XP4601
REC/PB SW
Q437
RN1102
PHASE CONTROL
Q436
2SC4738Y
BUFFER
Q3404
2SC4738Y
C SELECT SW
Q434
UMD2
C SELECT SW
Q433
XP1501
C SELECT SW
Q432
UMD2
IC403
BA7655AF
VCA1 PB OUT ADJ
VCA2 EMPH IN ADJ
BUFFER
Q415
2SA1832Y
BUFFER
Q435
2SC4738Y
PEAKING
AMP
BUFFER
Q417
XP6501
EQ
BUFFER
Q416
XP4601
TO LCD

10-5. AUDIO/POWER CIRCUIT SCHEMATIC DIAGRAM



*VOLTAGE MEASUREMENT MODE
PB . . . .Parentheses ( )
REC . . .Without parentheses

10-6. HEAD AMP CIRCUIT SCHEMATIC DIAGRAM

➡REC Y Signal ⇨PB Y Signal ⇨REC Audio FM Signal
➡REC C Signal ⇨PB C Signal ⇨REC Pilot signal
⇨PB RF Signal

DUNTK4673HE01
QPWBX4673GEZZ

SHIELD

TO MECHA (MECHA-GND)
TO SERVO (REC PILOT, PB RF, ATF GND)
TO AUD/POW (REC AFM, PB RF, GND)
TO Y/C (VIDEO IN/OUT, P-CON 4.9V, H/A 4.6V, ROT ERASE, H-SW-P, SP/LP, AV REC-H, REC C RF, REC Y RF, PB Y RF, PB C RF, D.D.P, GND, SSI, SSO, SCK, CAM ON, VTR ON, READY, VTR ADJ, CAM ADJ, SYS GND, SYS TEST, REMOCON IN, EE-L)

P301 CNDM2452TA

TEST 2		
1	REC Y RF	1
2	REC C RF	2
3	H-SW-P	3
4	PB RF	4
5	GND	5
6	SSI	6
7	SSO	7
8	SCK	8
9	REMOCON IN	9
10	GND	10
11	AUDIO IN/OUT	11
12	AUDIO GND	12
13	PRINTER VIDEO	13
14	PRINTER-H	14
15	P-CON 4.9V	15
16	VIDEO IN/OUT	16
17	GND	17
18	CAM ON	18
19	VTR ON	19
20	READY	20
21	VTR ADJ	21
22	CAM ADJ	22
23	SYS TEST	23
24	GND	24

TO AUD/POW (PRINTER-H) (PRINTER VIDEO) (AUDIO GND) (AUDIO IN/OUT)

RE SW Q1304 RN1104
RE OSC AMP Q1301 2SA1037KQ
RE OSC Q1303 2SA1037KQ
REC/PB SW Q304 RN1104
BUFFER Q303 XP8501
12dB AMP BUFFER Q302 XP6501
REC/PB AMP IC301 CXA1202R
CONTROL LOGIC
CH2 REC AMP
CH1 REC AMP
CH2 HEAD AMP 46dB
CH1 HEAD AMP 46dB
DOC DET ON/OFF Q305 RN2104

SC301 DSCN0946TAZZ

TO VIDEO HEAD		
1	FE(X)	1
2	FE(Y)	2
3	GND	3
4	GND	4
5	B(X)	7
6	B(Y)	8
7	GND	9
8	A(Y)	10
9	A(X)	11

SLD03 PSLDM9286GEFW
PSLDM9041TAZZ

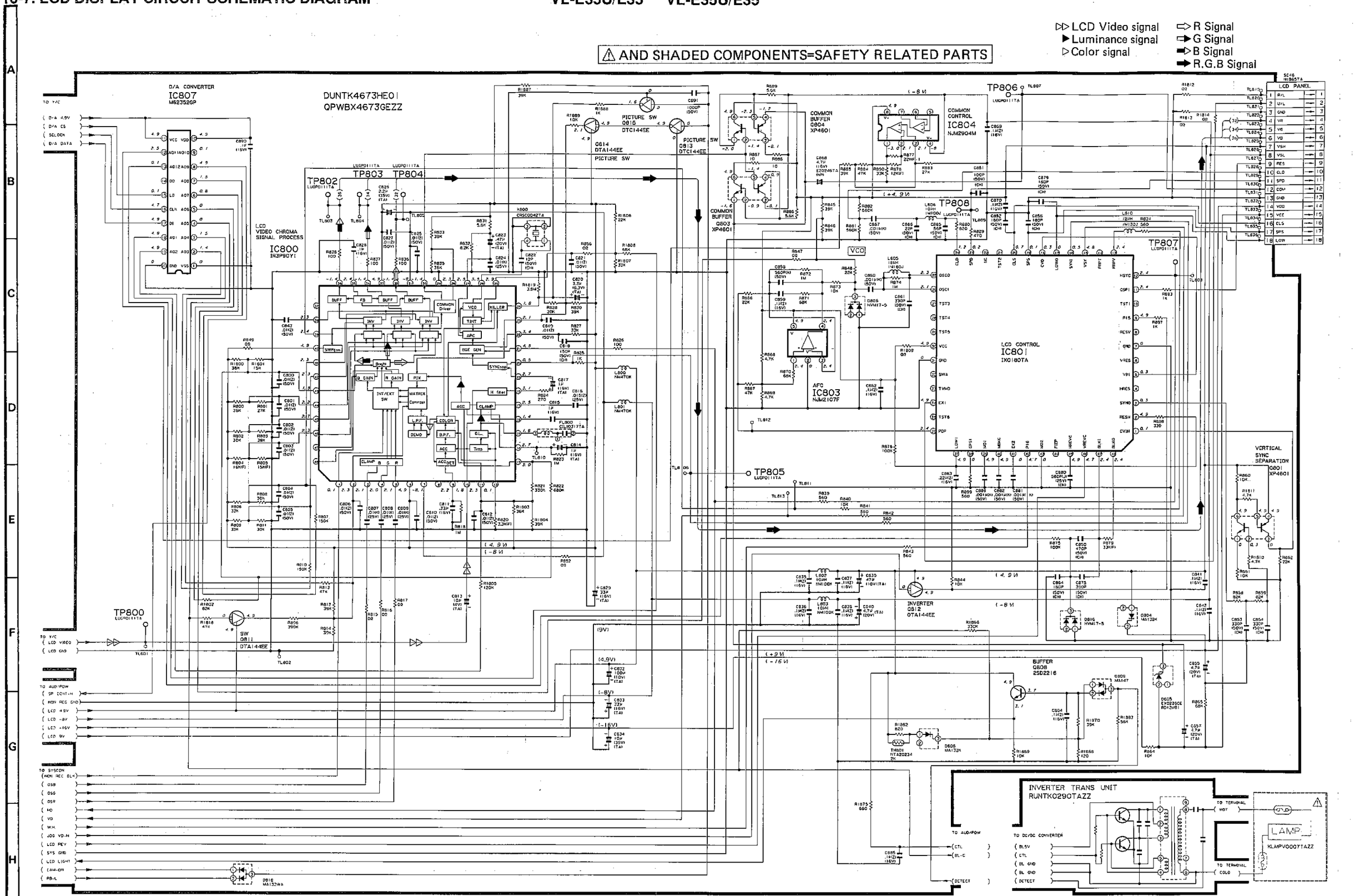
*VOLTAGE MEASUREMENT MODE
PB . . . .Parentheses ( )
REC . . .Without parentheses

10-7. LCD DISPLAY CIRCUIT SCHEMATIC DIAGRAM

VL-E30U/C
VL-E35U/E35

▷▷ LCD Video signal
▶ Luminance signal
▷ Color signal
⇨ R Signal
➡ G Signal
➡ B Signal
➡ R.G.B Signal

⚠ AND SHADED COMPONENTS=SAFETY RELATED PARTS

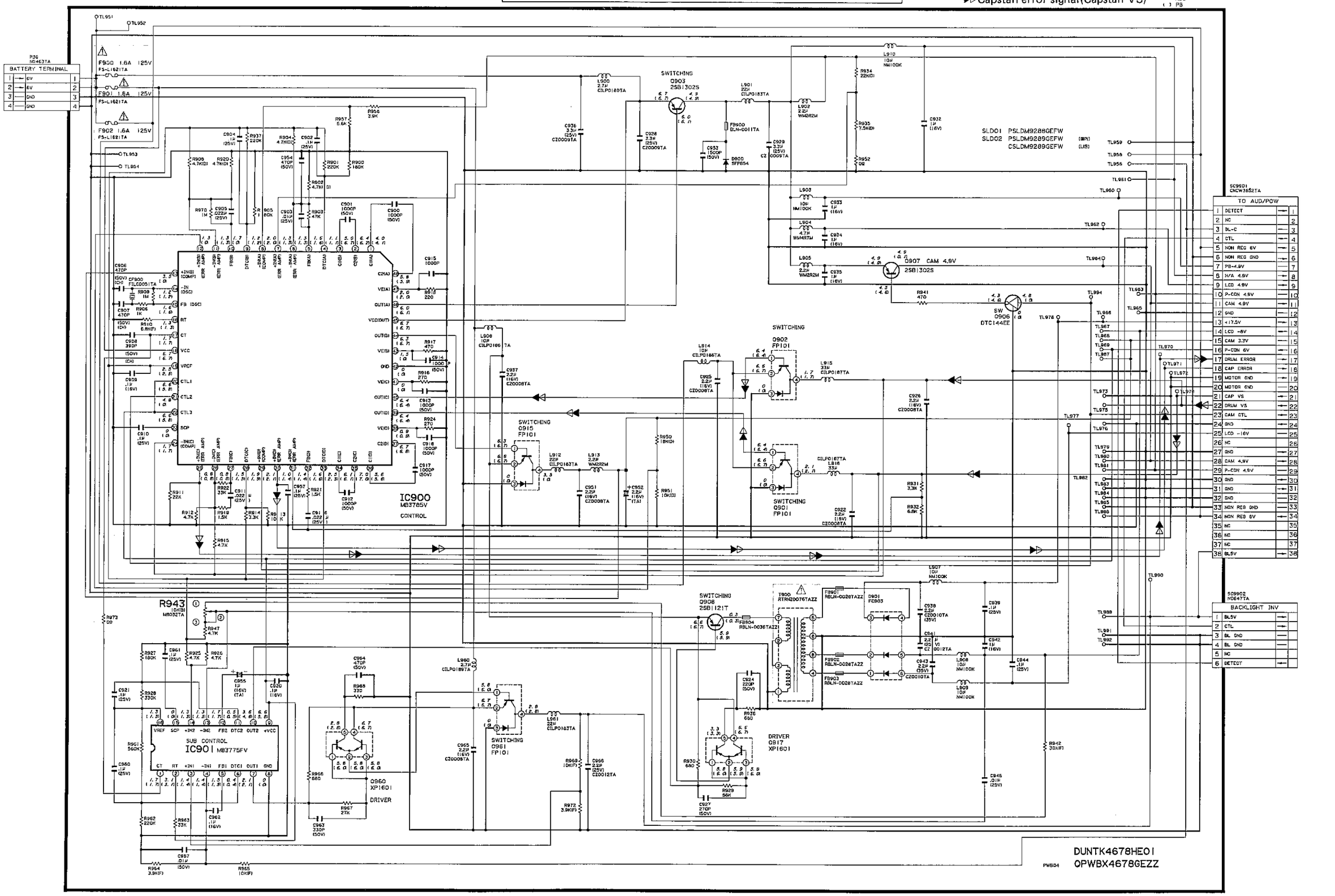


10-8. DC/DC CONVERTER CIRCUIT SCHEMATIC DIAGRAM

⚠ AND SHADED COMPONENTS=SAFETY RELATED PARTS

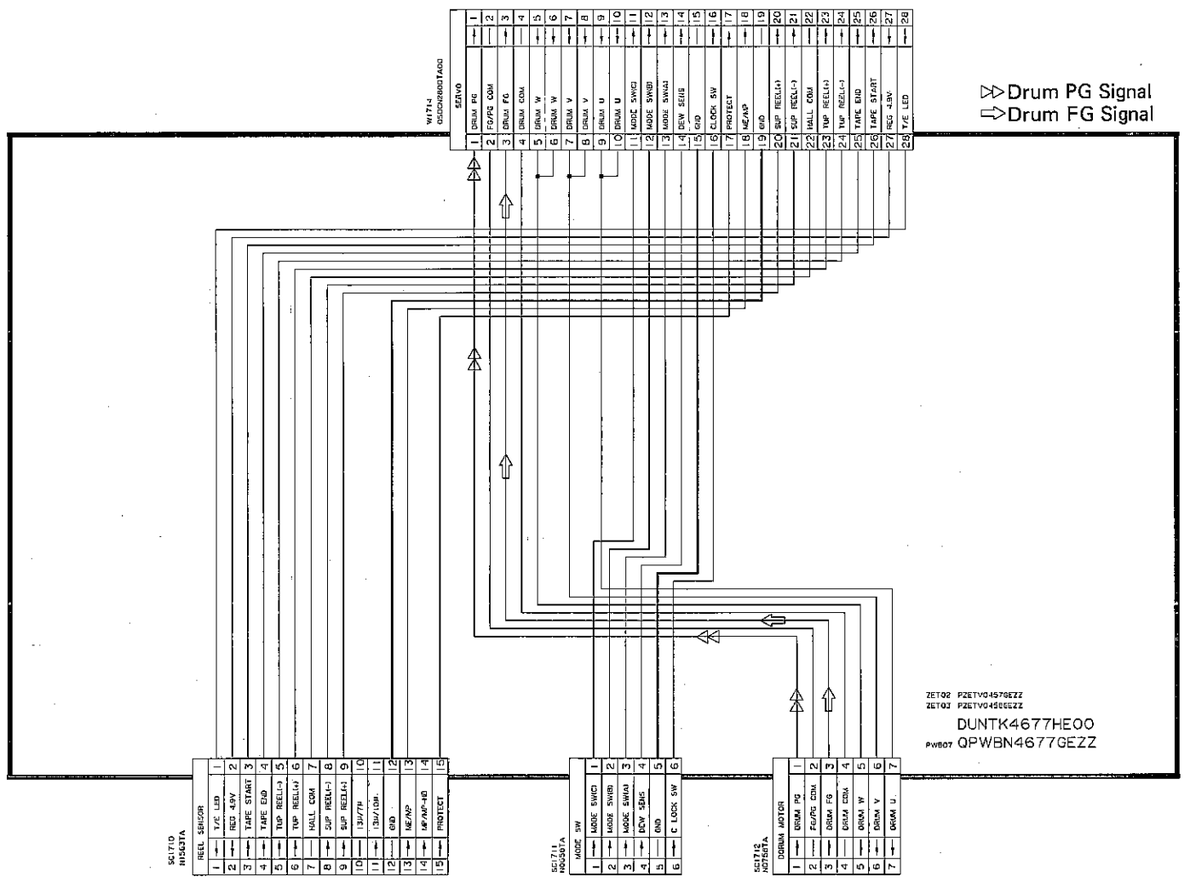
▷▶Drum error signal(Drum VS)
▶▷Capstan error signal(Capstan VS)

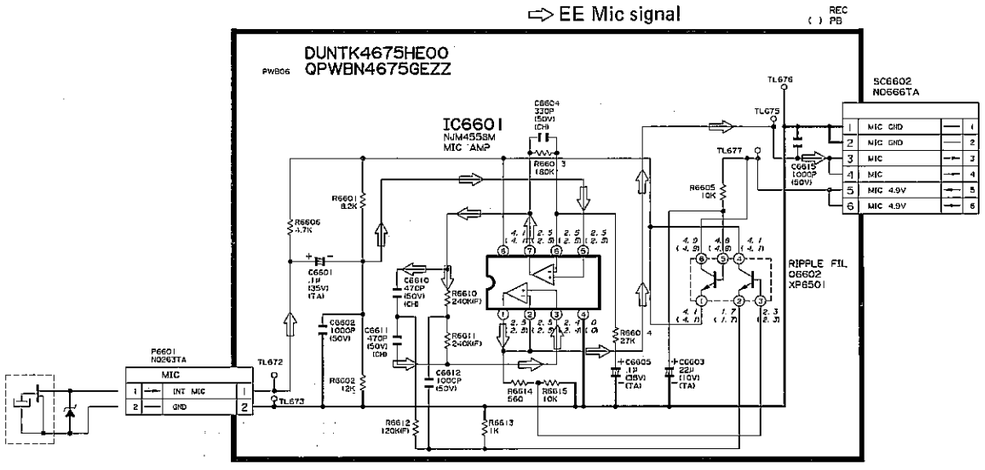
REC
( ) PB



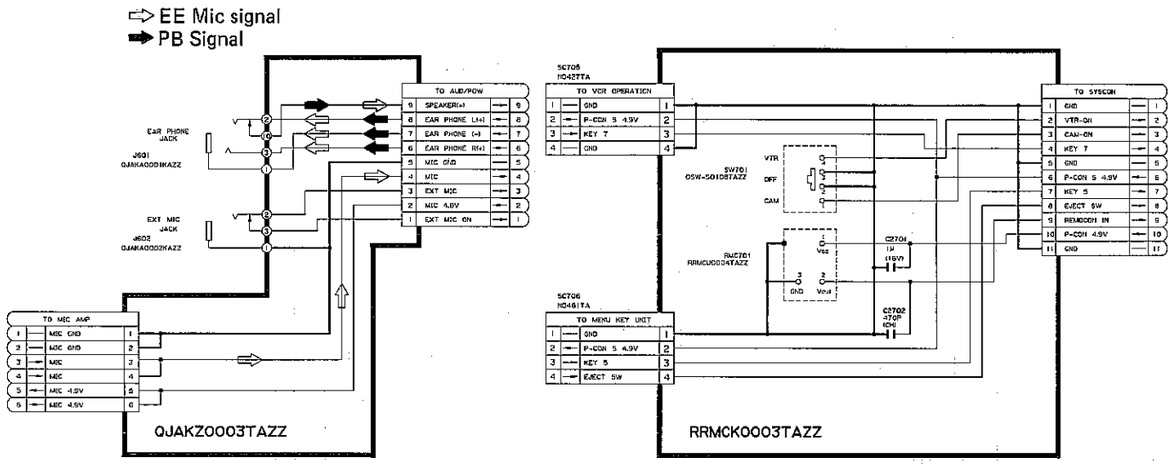
*VOLTAGE MEASUREMENT MODE
PB . . . .Parentheses ( )
REC . . .Without parentheses

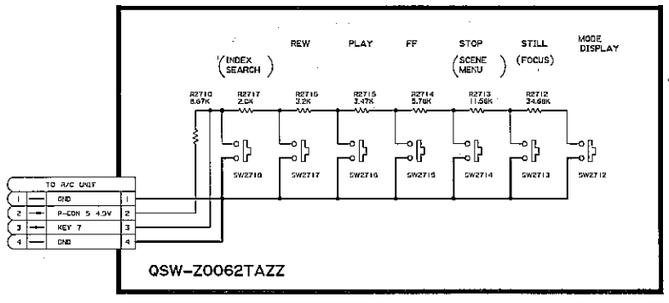
10-9. MECHA CIRCUIT SCHEMATIC DIAGRAM
MIC AMP CIRCUIT SCHEMATIC DIAGRAM

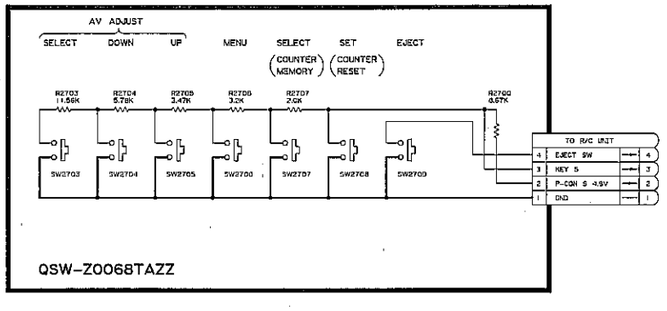




10-10. REMOCON AND POWER SW UNIT/JACK UNIT/VCR OPERATION UNIT/ MENU KEY UNIT CIRCUIT SCHEMATIC DIAGRAM



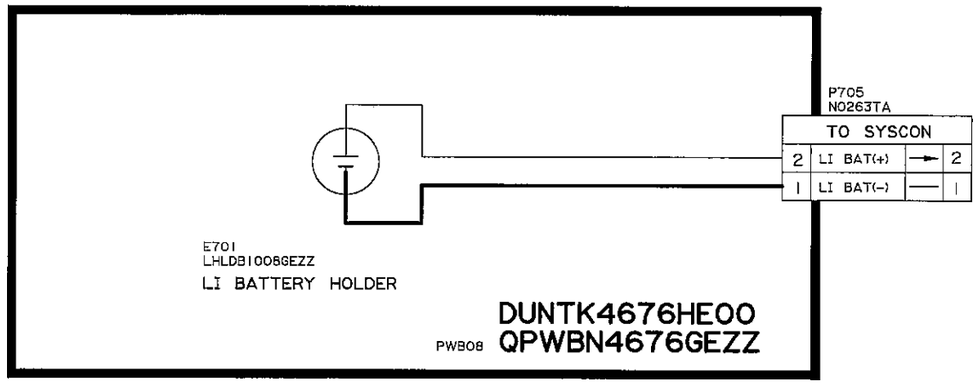


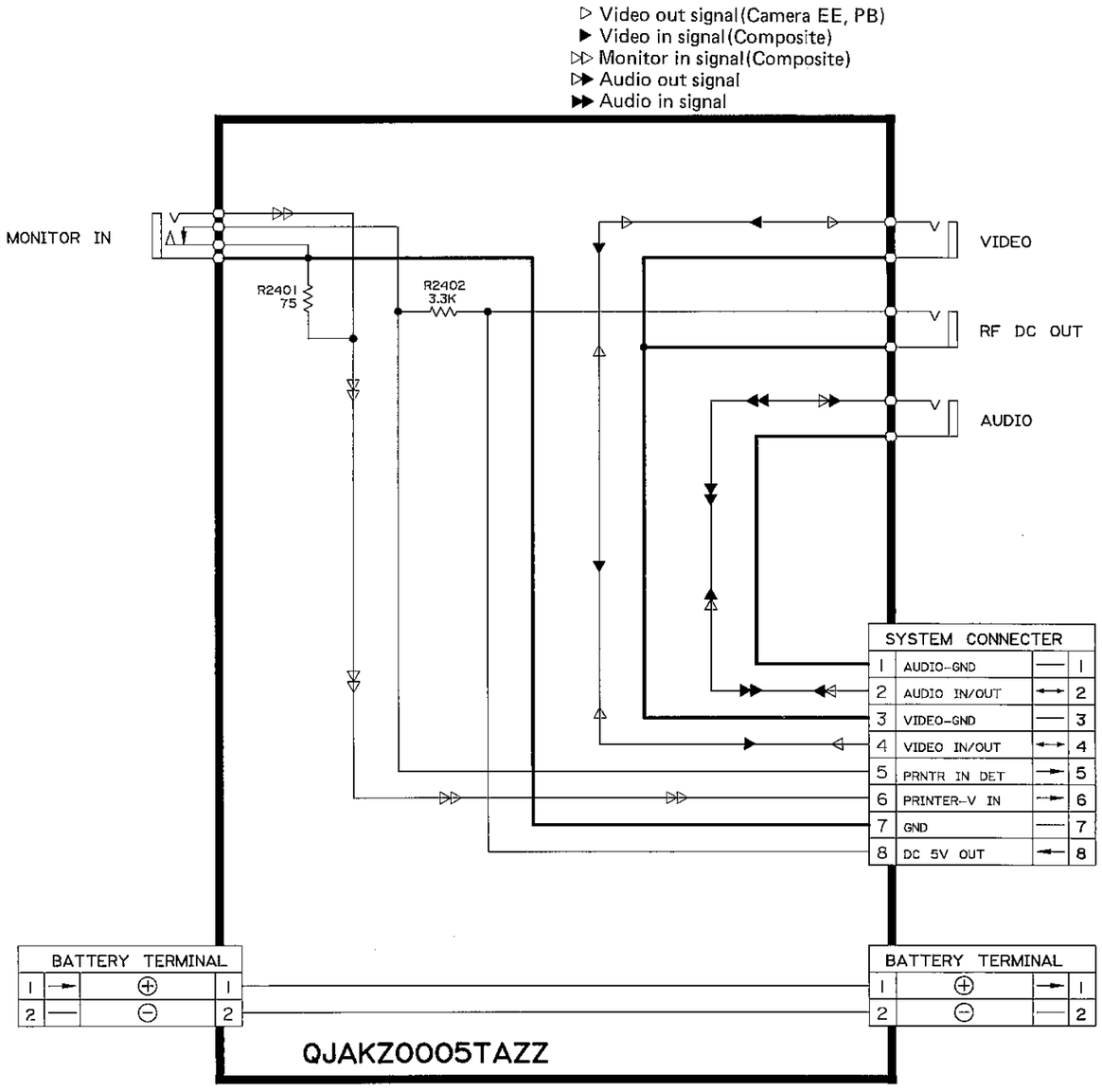


*VOLTAGE MEASUREMENT MODE
PB . . . .Parentheses ( )
REC . . .Without parentheses

VL-E30U/C
VL-E35U/E35

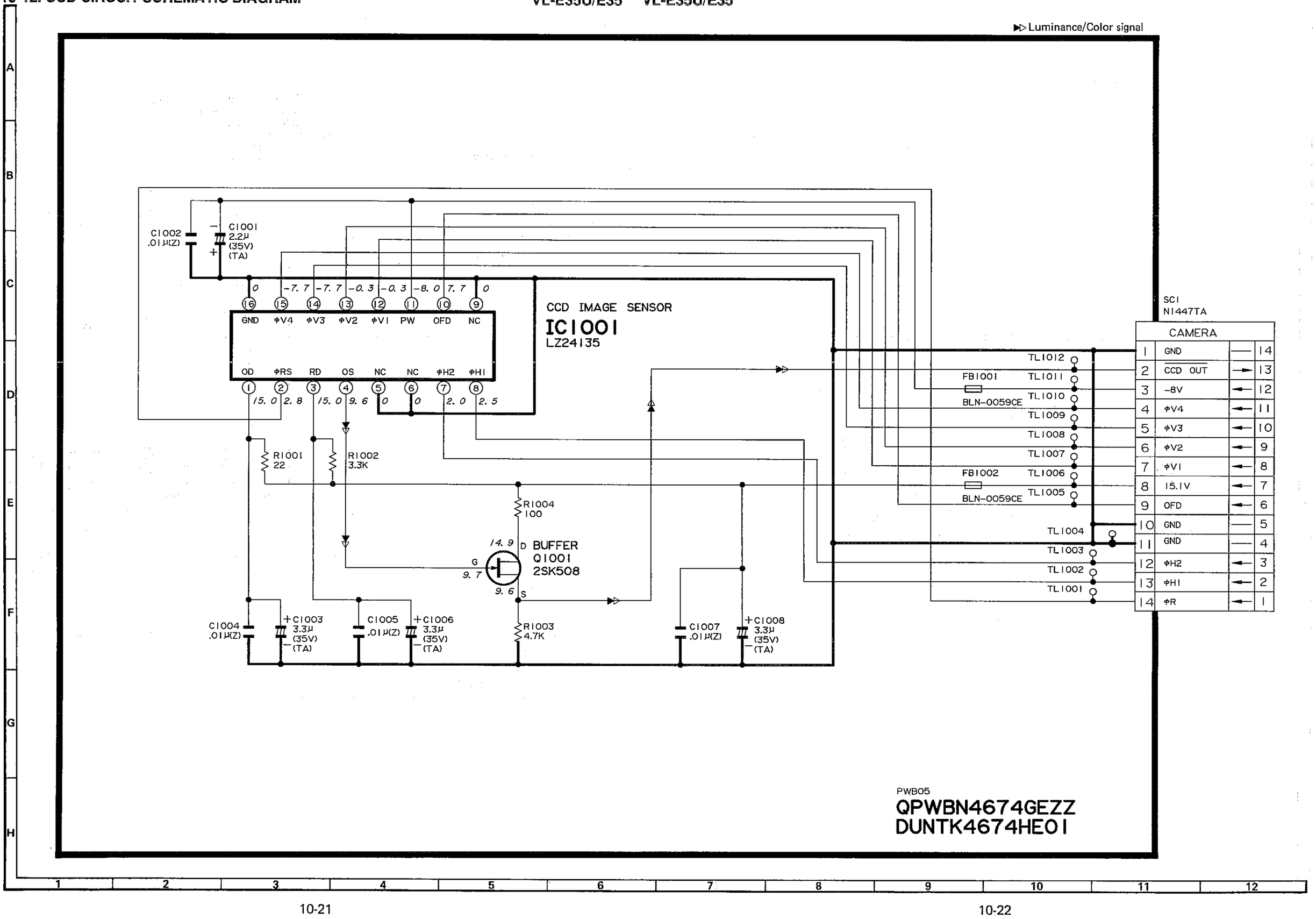
10-11. LI BATTERY UNIT/AV PACK CIRCUIT SCHEMATIC DIAGRAM



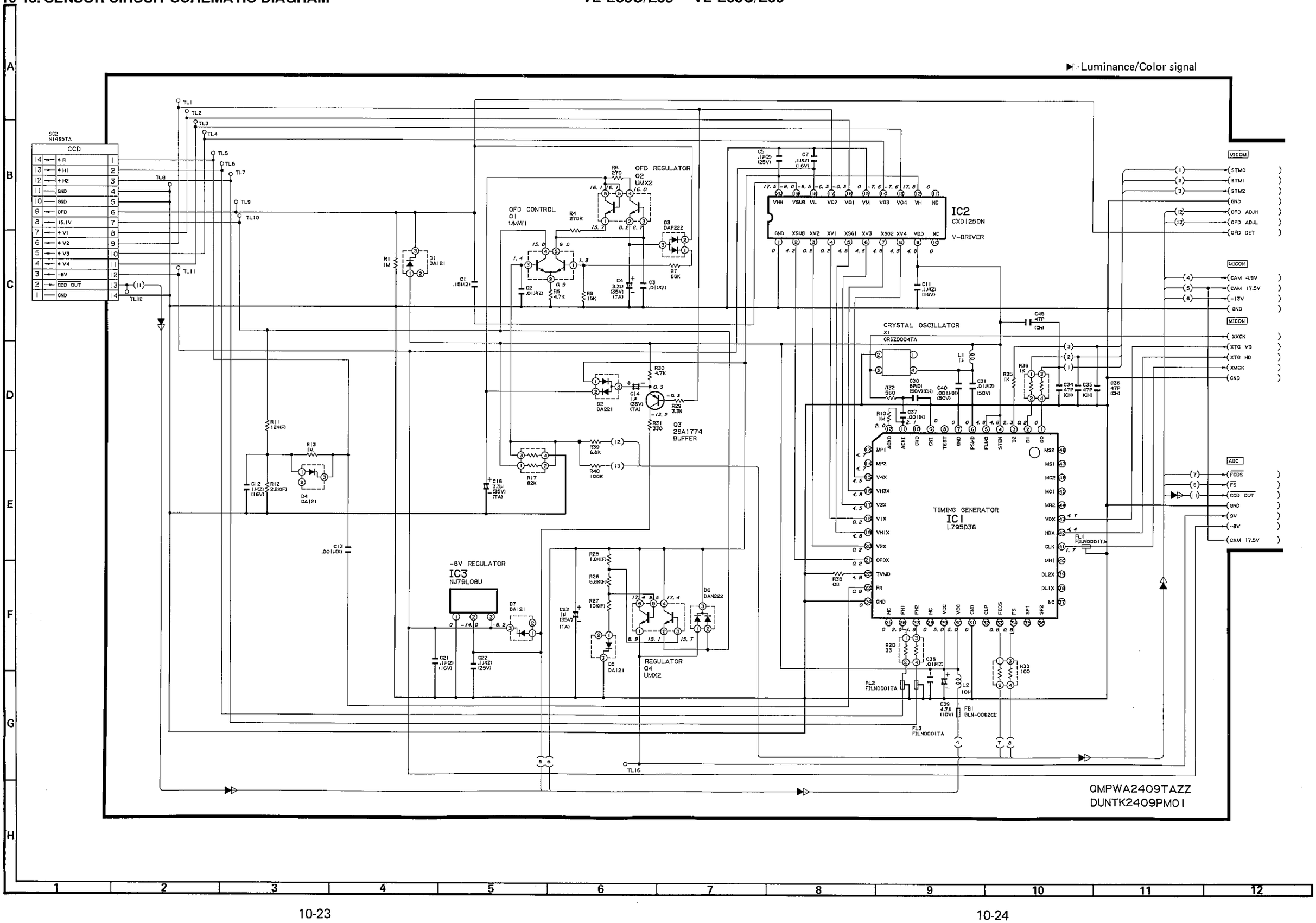


VL-E30U/C
VL-E35U/E35

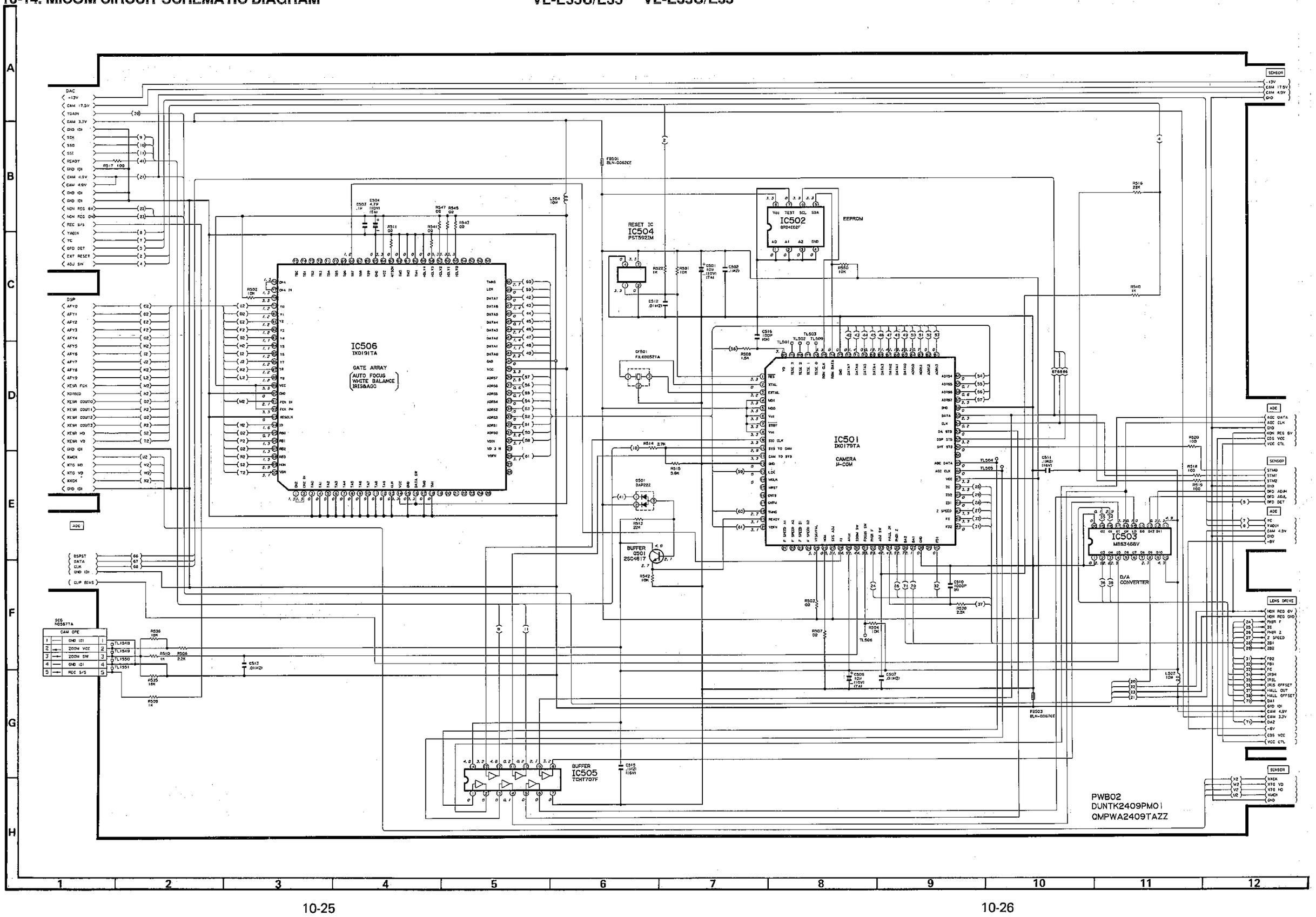
10-12. CCD CIRCUIT SCHEMATIC DIAGRAM



10-13. SENSOR CIRCUIT SCHEMATIC DIAGRAM

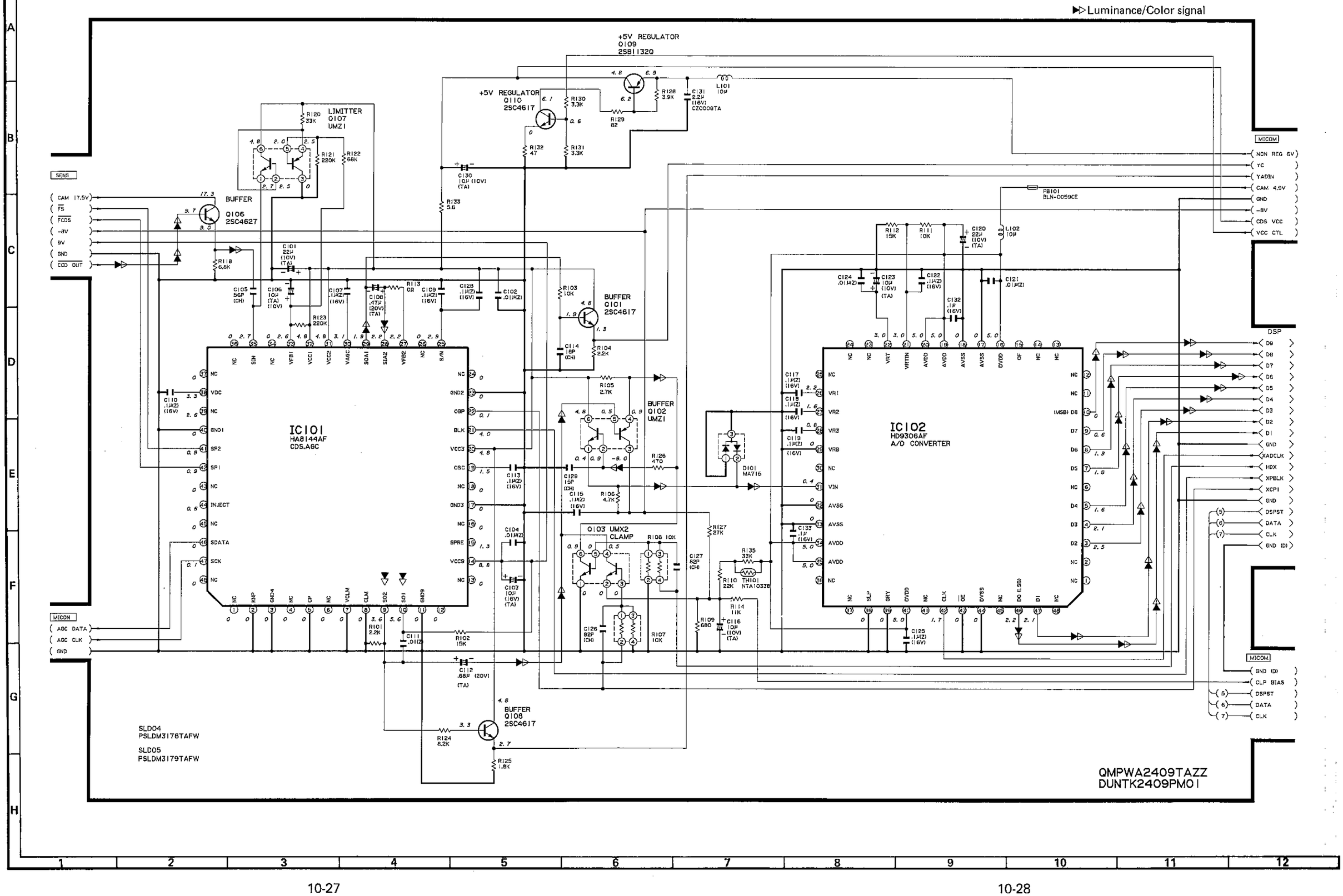


10-14. MICOM CIRCUIT SCHEMATIC DIAGRAM



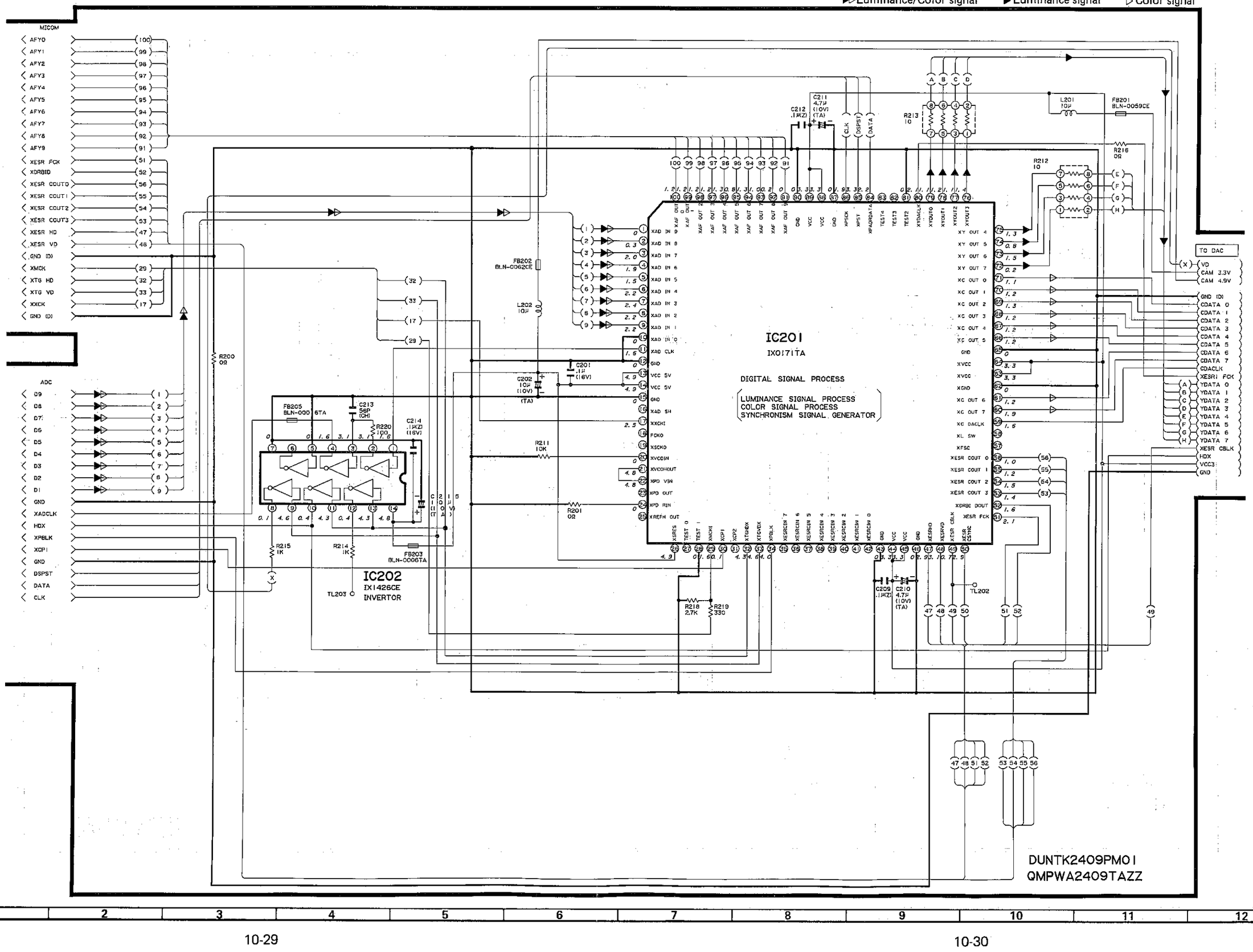
VL-E30U/C
VL-E35U/E35

10-15. ADC CIRCUIT SCHEMATIC DIAGRAM



10-16. DSP CIRCUIT SCHEMATIC DIAGRAM

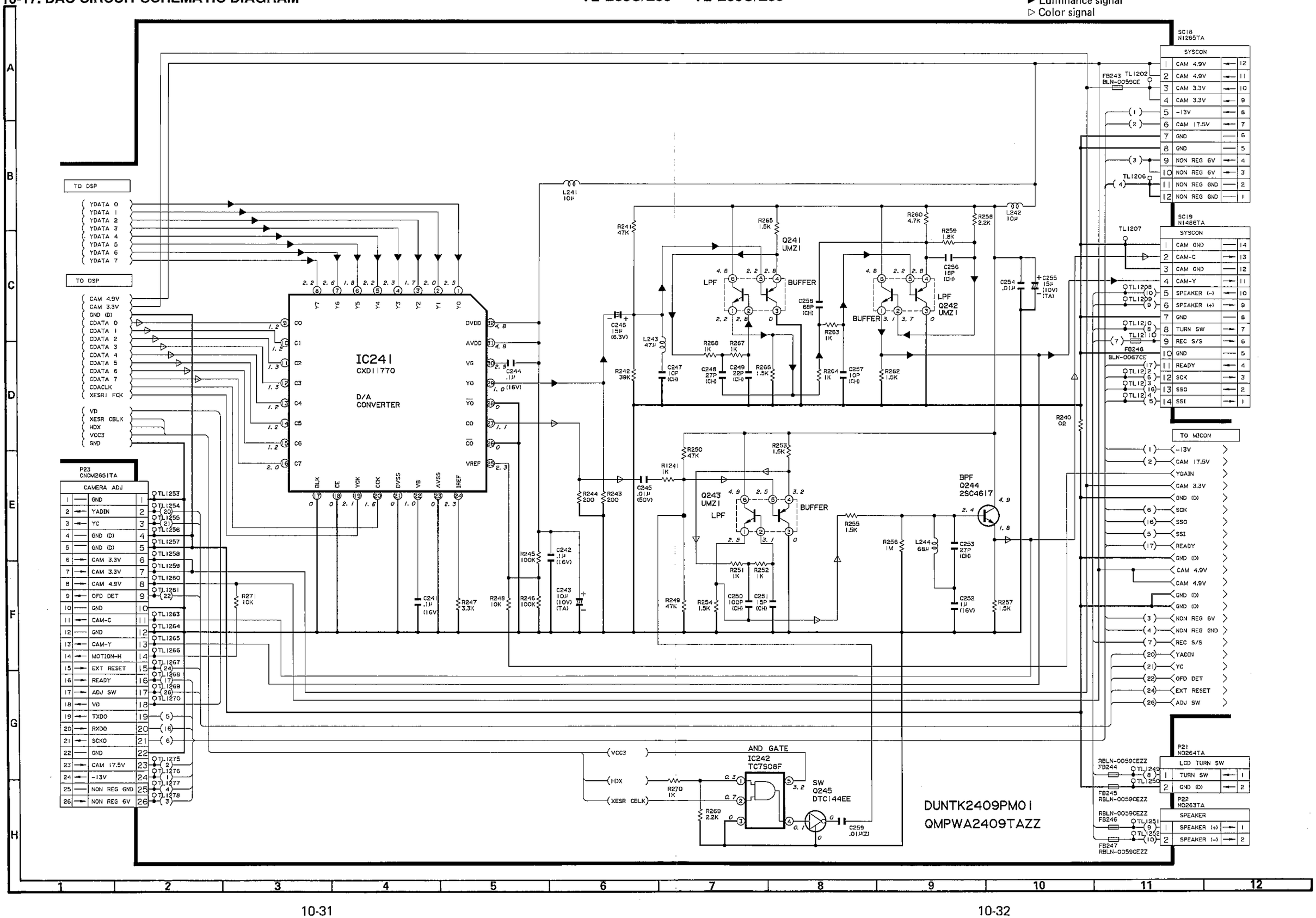
▶▷Luminance/Color signal ▶Luminance signal ▷Color signal



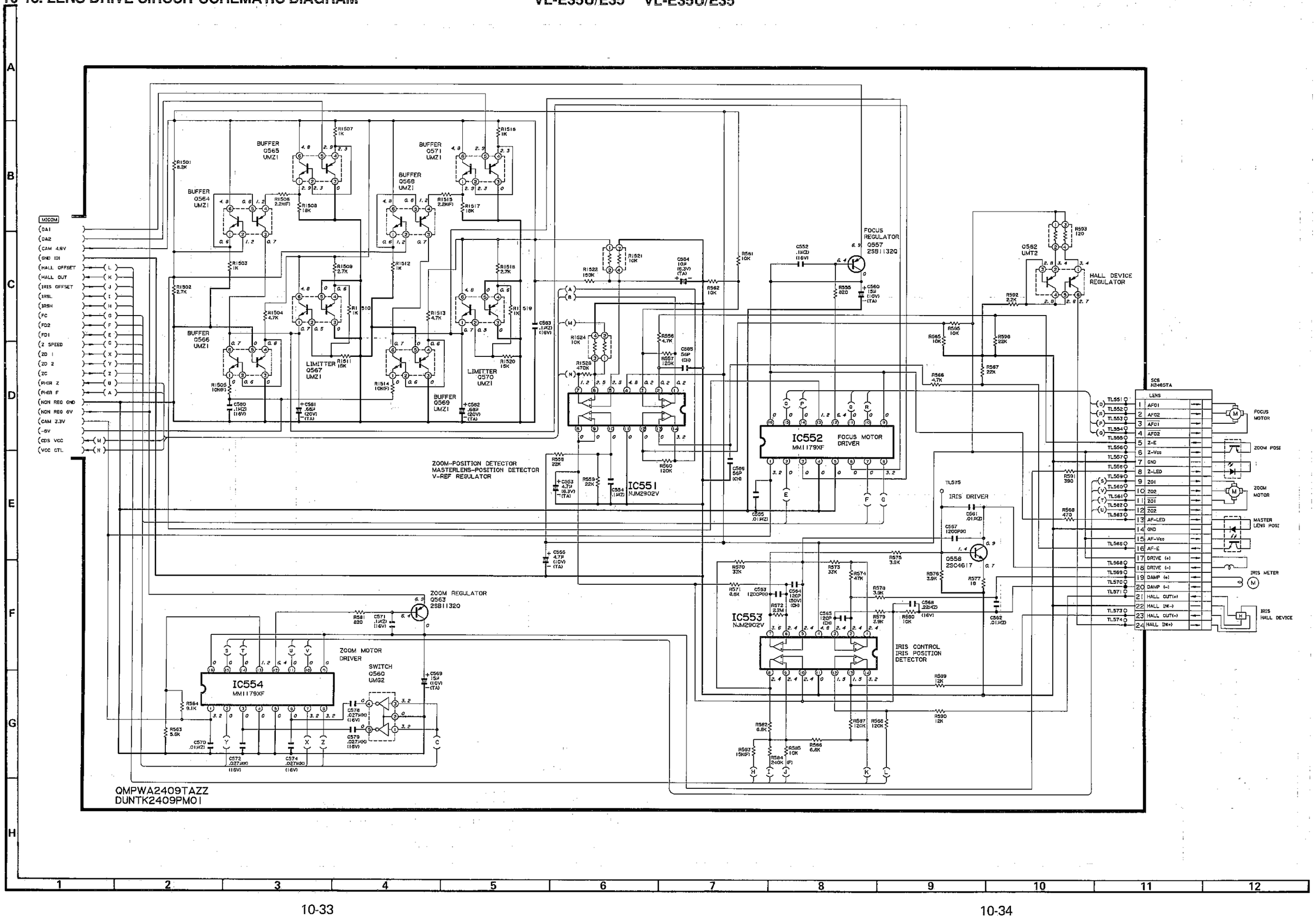
10-17. DAC CIRCUIT SCHEMATIC DIAGRAM

VL-E30U/C
VL-E35U/E35

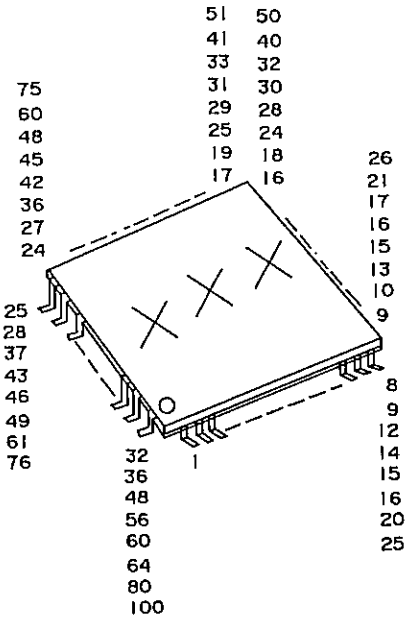
▶ Luminance signal
▷ Color signal



10-18. LENS DRIVE CIRCUIT SCHEMATIC DIAGRAM



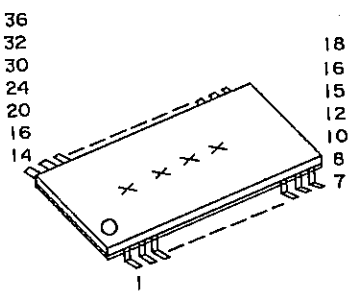
11. SEMICONDUCTOR LEAD IDENTIFICATION



CXA1202R
IC301
CXA1700R
IC401
CXD1177Q
IC241
HA8144AF
IC101
HD9306AF
IC102
IR3P90Y1
IC800

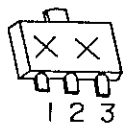
IXO164TA
IC701
IX0171TA
IC201
IX0179TA
IC501
IX0180TA
IC801
IX0191TA
IC506

LA7454W
IC602
LZ95D38
IC1
MB3785V
IC900
XR10813
IC1701

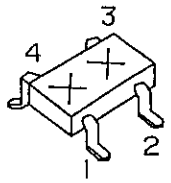


CXD1250N
IC2
CXL5502N
IC402
IX1426CE
IC202
IX0181TA
IC704
LB1880M
IC1705
M62352GP
IC807, 5401
MB3775FV
IC901

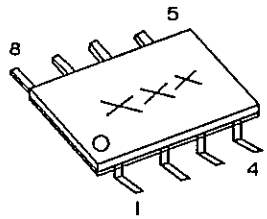
MB8346BV
IC503
MM1179XF
IC552, 554
MPC1727V
IC1704
NJM2285M
IC1402
NJM2902V
IC551, 553, 1703
TCHT707F
IC505



NJ79L08U
IC3
NJ79L09U
NJM79L09

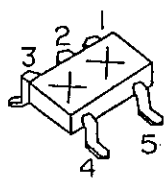


PST592EM
PST592IM
IC504

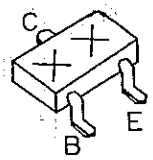


BA7655AF
IC403, 3401
BR24C02F
IC502
CA93C46J
IC705
NJM2509V
IC1401

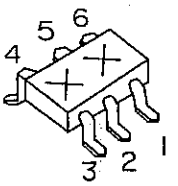
NJM4558M
IC6501, 6601
NJM2904M
IC804, 1702
S8420AF
IC702
TDA7052A
IC6401



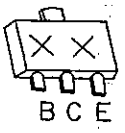
NJM2107F
IC803
SC14S66F
IC603
SC7S08F
IC703, 707
SC7S32F
IC706
TA75S01F
TC7S04F
TC7S08F
IC242
TC7S32F



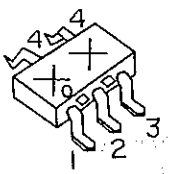
2SA1037
Q1301, 1303
2SA1162Y
2SA1298Y
Q6403, 9901
2SA1577R
2SA1774F
Q3
2SA1832Y
Q411, 415
2SB12956
Q9903
2SB1462
2SC3931C
2SC4116Y
2SC4555
2SC4617B
Q101, 108, 110, 244, 501, 558
2SC4627
Q106
2SC4738
Q402, 403, 404, 409, 435, 436, 1403, 1405, 3401, 3403, 3404, 6501, 9900, 9907
2SD1819A
2SD2216
Q808, 1710
2SD602A
BC847B1F
DTA114EE
DTA144EE
Q811, 812, 814
DTC114EE
DTC144EE
Q245, 813, 815, 906, 920, 6504, 9908
DTC144EU
DTC323
Q603
RN1102
Q437, 1701
RN1104
Q304, 1304, 1404
RN2104
Q305, 401, 701, 1408
UN5111
UN5113
UN9213



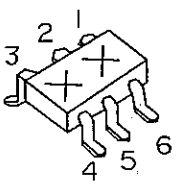
RN4604
Q604, 712, 6503
XN4402
Q6401
XN4501
Q1704



2SB1121T
Q908, 1708
2SB1132Q
Q109, 557, 563
2SB1302S
Q903, 907
2SD874AS

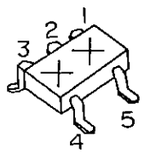


FP101
Q901, 902, 915, 961
FP103

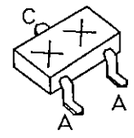


UMB2
Q9906
UMD2
Q406, 432, 434
UMT1
Q1702
UMT2
Q562
UMX2
Q2, 4, 103
UMZ1
Q102, 107, 241, 242, 243, 564, 565, 566, 567, 568, 569, 570, 571
XP4111
Q715
XP4113
XP4213
XP4601
Q412, 416, 801, 803, 804, 3405
XP6401
XP6501
Q302, 303, 405, 417, 1406, 1407, 1703, 3402, 6602

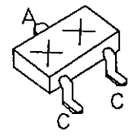
VL-E30U/C
VL-E35U/E35



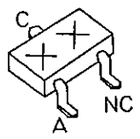
UMA2
UMA7
UMG2
Q560, 6402, 6404, 6502
UMG8
UMW1
Q1
XP1113
XP1501
Q433, 606
XP1213
XP1601
Q917, 960



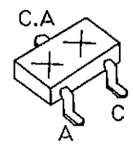
DAN222
D6, 601
HVM17-5
D401, 806, 816
MA132WK
D701, 704



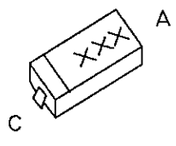
DAP222
D3, 501
MA132WA
D703, 818, 1402



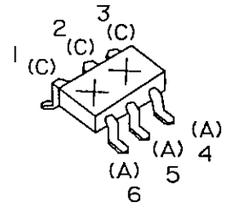
EX0148TA
EX0151TA
EX0226CE
D805
EX0626CE
D9901
EX0227CE
EX0231CE
DA121
D1, 4, 5, 7
MA132K
D602, 603, 702, 705, 706, 804, 808



DA221
D2
MA133
D1403, 1404, 1405
MA147
D809, 3401
MA715
D101



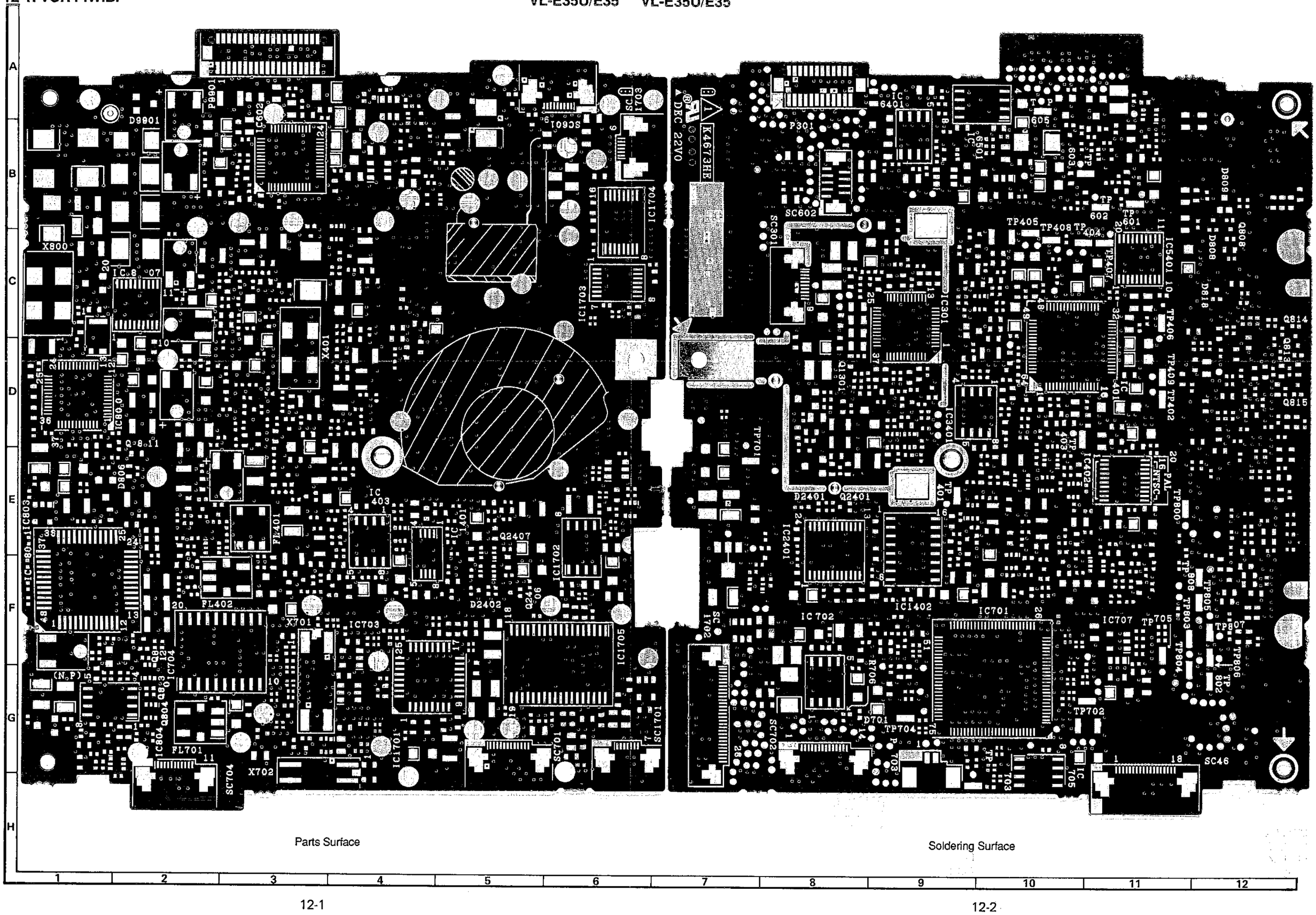
MA335Q
SFPB52
SFPB54
D900



FC903
D901

VL-E30U/C
VL-E35U/E35

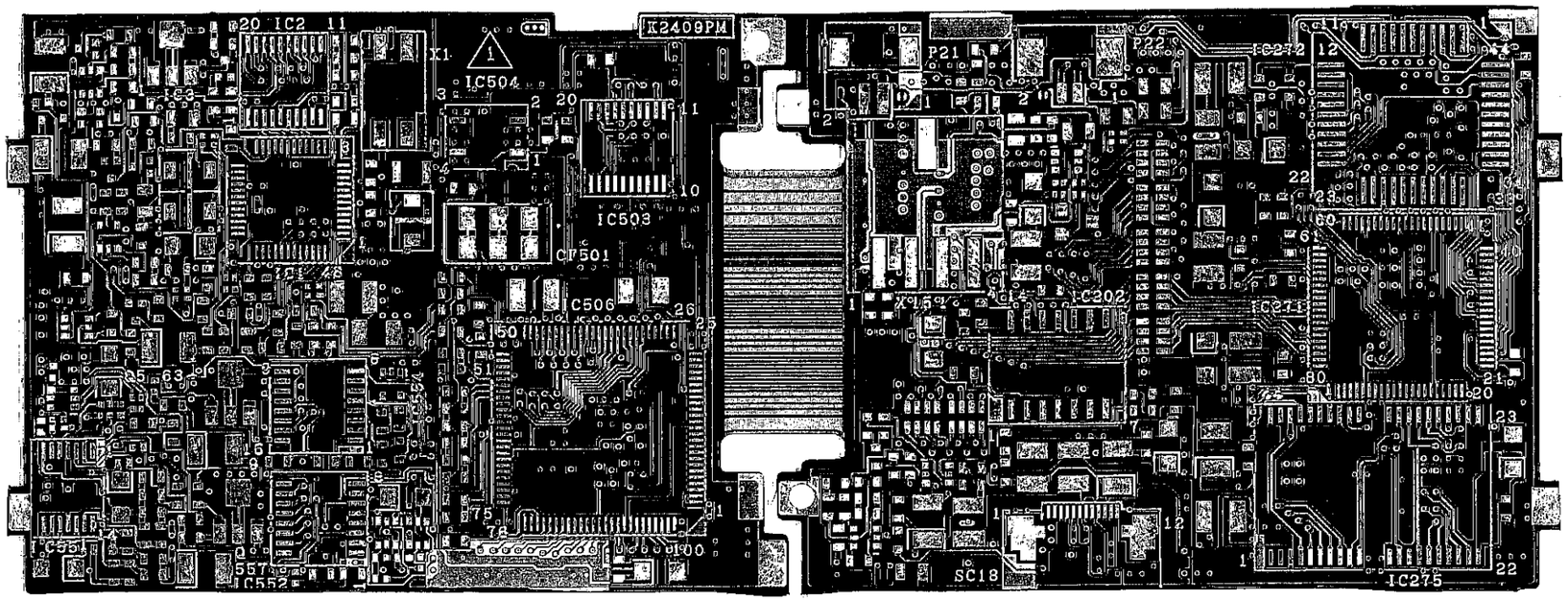
12-1. VCR P.W.B.



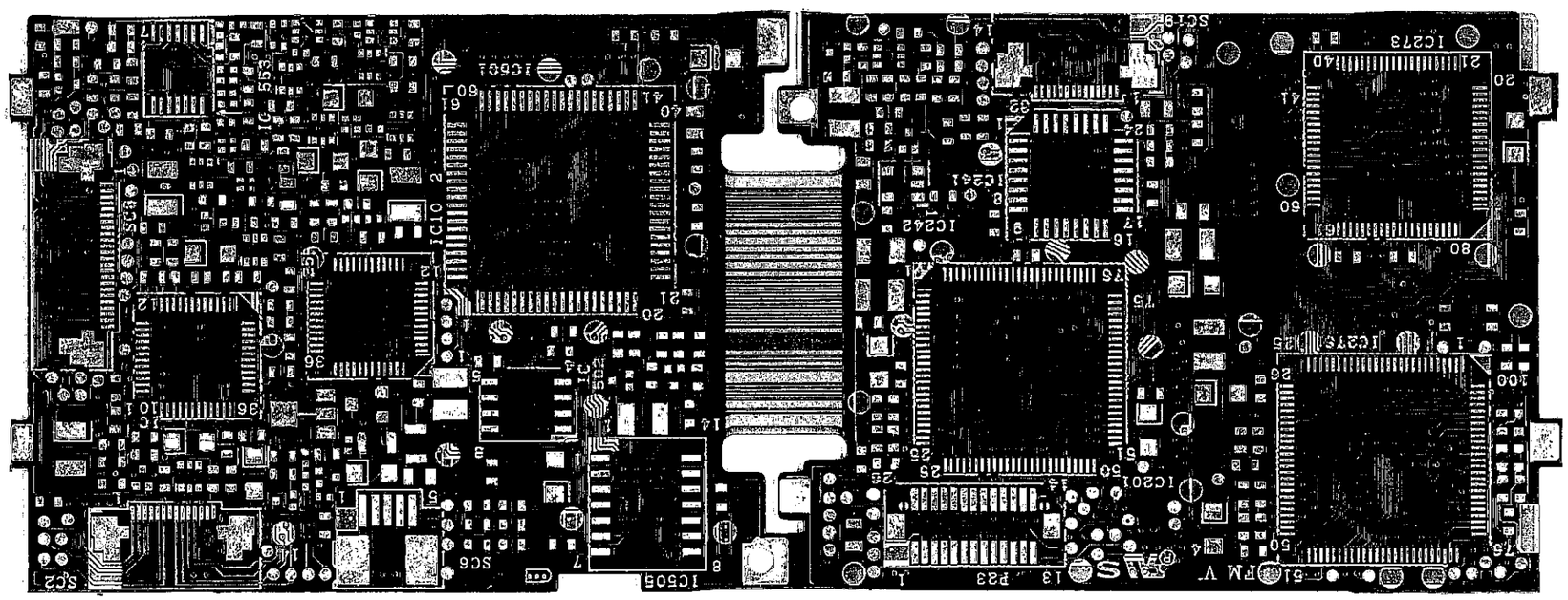
12-1

12-2

12-2. CAMERA P.W.B.



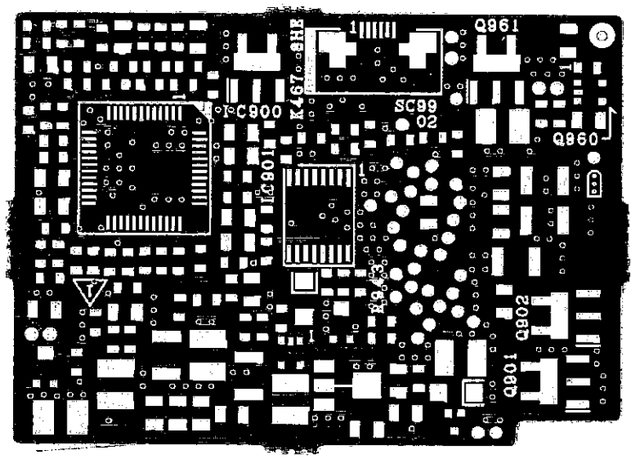
Parts Surface



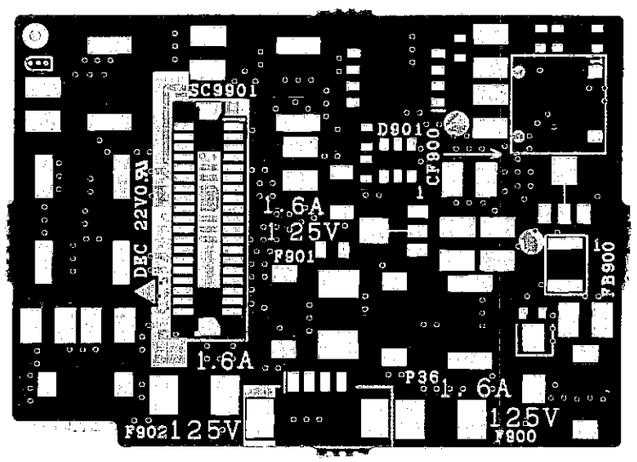
Soldering Surface

VL-E30U/C
VL-E35U/E35

12-3. DC/DC CONVERTER PWB

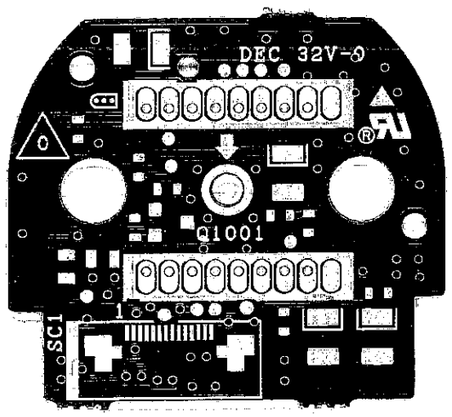


Parts Surface

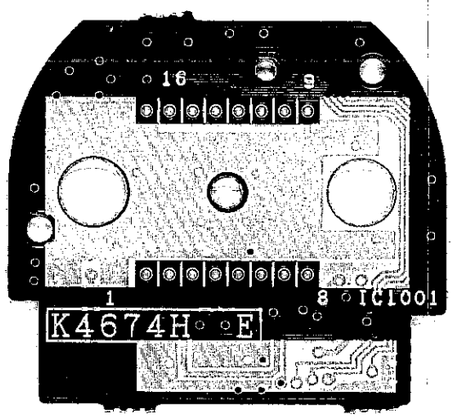


Soldering Surface

12-4. CCD PWB

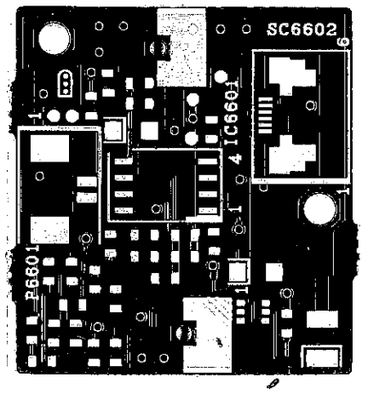


Parts Surface

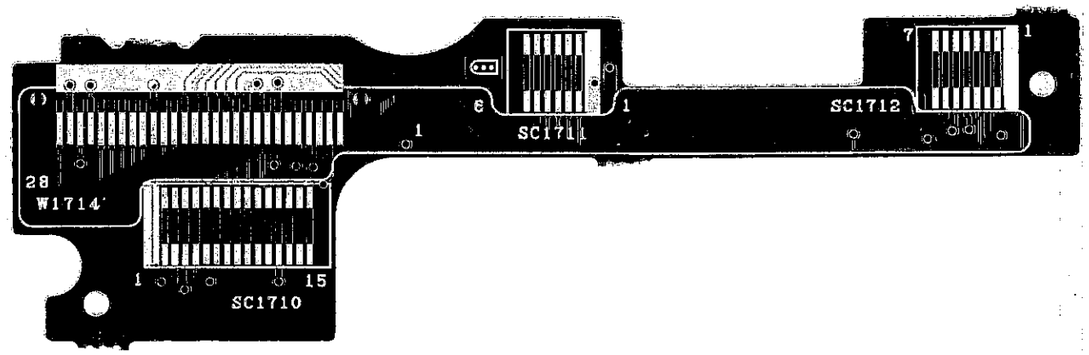


Soldering Surface

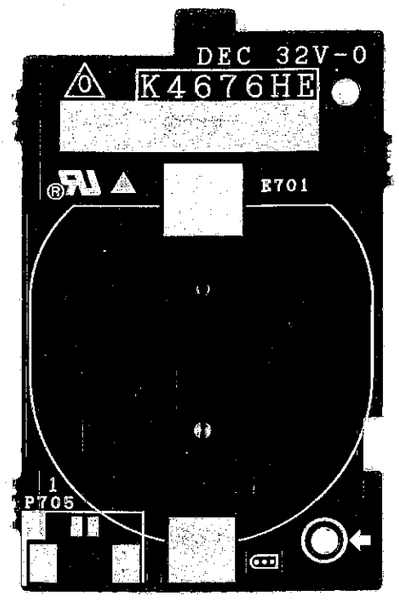
12-5. MIC AMP PWB



12-6. MECHA INTERCONNECTION PWB

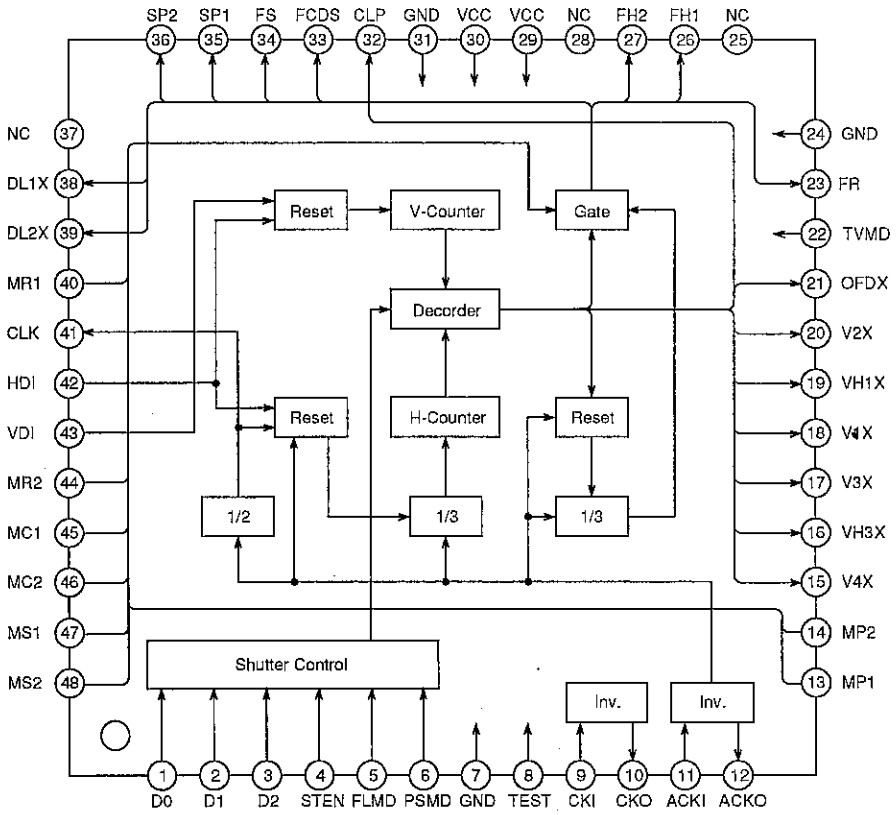


12-7. LITHIUM BATTERY PWB



13. FUNCTION TABLE OF IC

• IC1 (LZ95D38)
TIMING GENERATOR



FUNCTIONS OF PINS

Pin No.	Signal name	Function
1~3	D0~D2	Electronic shutter speed control input terminals.
4	STEN	Shutter mode setting input terminal. H: Shutter mode, L: Normal mode
5	FLMD	Flickerless shutter mode setting input terminal.
6	PSMD	Input terminal for selecting the electronic shutter speed setting data input. H: Parallel data input mode, L: Serial data input mode
7	GND	Grounding terminal.
8	TEST	Test input terminal, usually at OPEN/L.
9	CK1	Reference clock input terminal.
10	CK0	CK1 (9) inversion output terminal.
11	ACK1	Reference clock duty adjustment input terminal.
12	ACK0	ACK1 (11) inversion output terminal.
13	MP1	Phase control input terminal for the trailing edge of color separation sample hold pulses SP1 (35) and SP2 (36) versus the leading edge of FH2 (27).
14	MP2	<table><tr><td>MP1</td><td>H</td><td>L</td><td>L</td><td>H</td><td></td></tr><tr><td>MP2</td><td>H</td><td>H</td><td>L</td><td>L</td><td>A: about 5 ns</td></tr><tr><td>Phase difference</td><td>A</td><td>A+a</td><td>A+2a</td><td>A+3a</td><td>a: about 1.5 ns</td></tr></table>
15	V4X	Pulse output terminal for driving the area sensor's vertical CCD shift register # 4.

Pin No.	Signal name	Function
16	VH3X	Pulse output terminal for transferring the photodiode's electric charge to the area sensor's vertical CCD shift register # 3.
17	V3X	Pulse output terminal for driving the area sensor's vertical CCD shift register # 3.
18	V1X	Pulse output terminal for driving the area sensor's vertical CCD shift register # 1.
19	VH1X	Pulse output terminal for transferring the photodiode's electric charge to the area sensor's vertical CCD shift register # 1.
20	V2X	Pulse output terminal for driving the area sensor's vertical CCD shift register # 2.
21	OF•DX	Pulse output terminal for sweeping away the electric charge with the electronic shutter in operation. To be superimposed on the area sensor's OFD voltage. H level at normal mode.
22	TVMD	Input terminal for selecting the TV broadcast system. L: NTSC, H/OPEN: PAL.
23	FR	Pulse output terminal for resetting the area sensor's output circuit electric charge.
24	GND	Grounding terminal.
25	NC	Not used.
26	FH1	Pulse output terminal for driving the area sensor's horizontal CCD shift register # 1.
27	FH2	Pulse output terminal for driving the area sensor's horizontal CCD shift register # 2.
28	NC	Not used.
29	VCC	+4.9V power supplied.
30	VCC	+4.9V power supplied.

FUNCTIONS OF PINS

Pin No.	Signal name	Function
31	GND	Grounding terminal.
32	CLP	Clamp pulse output terminal for clamping the area sensor's dummy output. Continuous pulses with horizontal cycle.
33	FCDS	Clamp pulse output terminal for clamping the area sensor's output signal at high speed.
34	FS	Pulse output terminal for sample-holding the area sensor's output signal.
35,36	SP1,SP2	Sample-hold pulse output terminal for color separation of the area sensor's output signal.
37	NC	Not used.
38,39	DL1X,DL2X	Drive pulse output terminal for delay.
40	MR1	Phase control input terminal for the trailing edge of FR (23) versus the leading edge of FH2 (27). Pulse width slightly variable.
41	CLK	Output terminal for continuous pulse (frequency-divided by 1/2 of reference clock at ACK1 (11)). In sync with the trailing edge of ACK1 (11) signal. NTSC: 14.31818 MHz, 910 fH PAL: 14.18750 MHz, 908 fH
42	HDI	Timing IC's horizontal reference signal input terminal. Negative horizontal reference pulse to be supplied from SSG-IC.
43	VDI	Timing IC's vertical reference signal input terminal. Negative vertical reference pulse to be supplied from SSG-IC.

Pin No.	Signal name	Function
44	MR2	Phase difference control input terminal for the trailing edge of the area sensor's reset pulse FR (23) versus the leading edge of FH2 (27). Pulse width slightly variable.

MR1	H	L	L	H	
MR2	H	H	L	L	A: about 22 ns
Phase width	A	A+a	A+2a	A+3a	a: about 1 ns

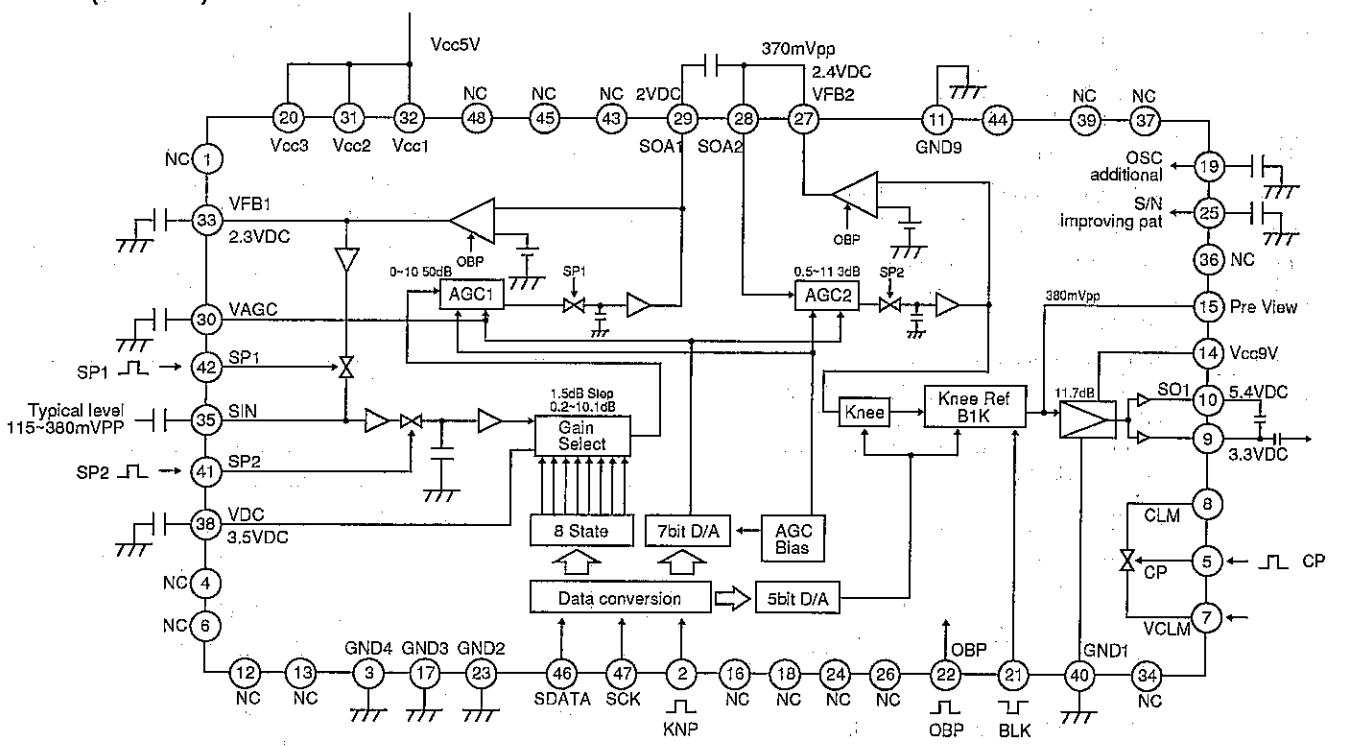
45,46	MC1,MC2	Phase control input terminal for the trailing edge of high-speed clamp pulse FCDS (33) versus the trailing edge of FH2 (27). PUlse width slightly variable.

MC1	H	L	L	H	
MC2	H	H	L	L	A: about 0 ns
Phase difference	A	A+a	A+2a	A+3a	a: about 1.5 ns

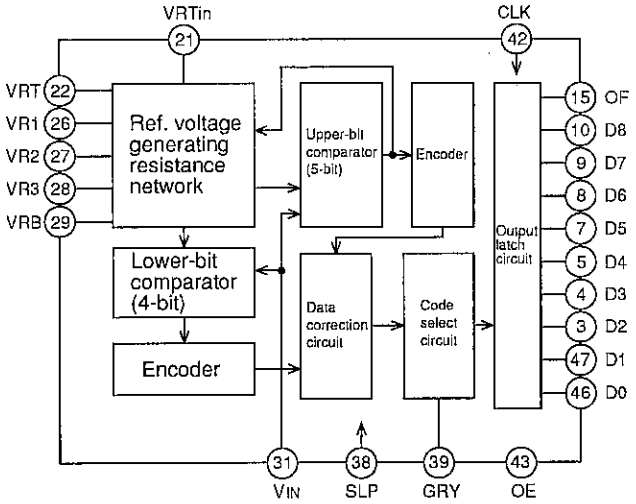
47,48	MS1,MS2	Phase control input terminal for the trailing edge of sample-hold pulse FS (34) versus the leading edge of FH2 (27). Pulse width slightly variable.

MS1	H	L	L	H	
MS2	H	H	L	L	A: about 2 ns
Phase difference	A	A+a	A+2a	A+3a	a: about 1.5 ns

• **IC101 (HA8114F)**



• IC102 (HD9306AF)



FUNCTIONS OF PINS

Pin No.	Signal name	Function
1,2	NC	Not used
3~5	D2~D4	Digital output
6	NC	Not used
7~9	D5~D7	Digital output
10	D8	Digital output (MSB)
11~14	NC	Not used
15	OF	Digital output (overflow)
16	DVDD	Digital power terminal (+4.9V)
17,18	AVSS	Analog grounding (0V)
19,20	AVDD	Analog power terminal (+4.9V)
21	VRTin	Reference voltage (high) operational amplifier input (+3V)
22	VRT	Reference voltage (high) input (+3V)
23~25	NC	Not used
26~28	VR1~VR3	Reference voltage intermediate tap
29	VRB	Reference voltage (low) input (0V)
30	NC	Not used

Pin No.	Signal name	Function
31	VIN	Analog signal input (0~3V)
32,33	AVSS	Analog grounding (0V)
34,35	AVDD	Analog power terminal (+4.9V)
36,37	NC	Not used
38	SLP	Sleep mode control input H: Sleep mode, L: Normal mode
39	GRY	Output code select input H: Gray code, L: Binary code
40	DVDD	Digital power terminal (+4.9V)
41	NC	Not used
42	CLK	Conversion clock input
43	$\overline{OE}$	Digital output enable input H: High impedance, L: Normal mode
44	DVSS	Digital grounding (0V)
45	NC	Not used
46	D1	Digital output (VSB)
47	D2	Digital input
48	NC	Not used

• IC201 (iX0171TA)
DSP

FUNCTIONS OF PINS

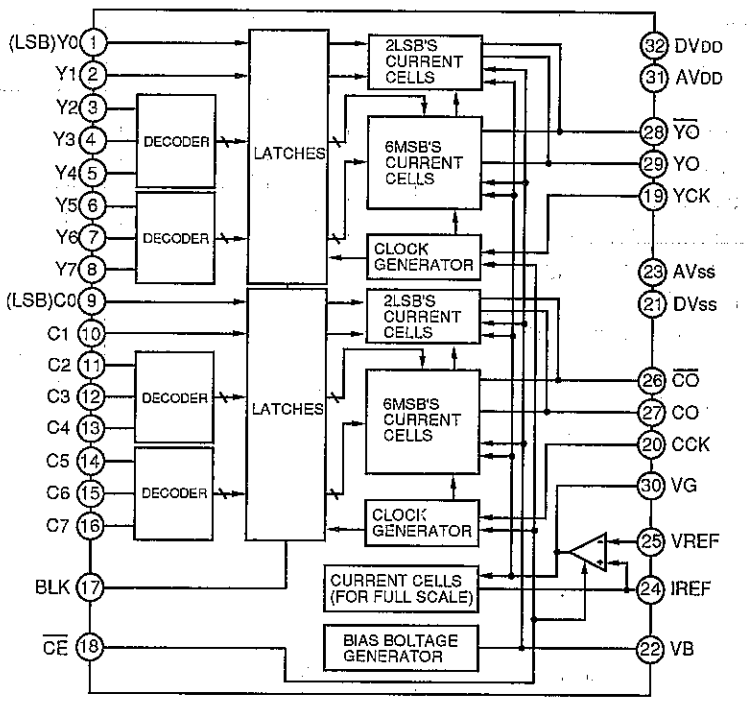
Pin No.	Signal name	I/O	Function
1~10	XADIN 9~XADIN 0	I	AD SIGNAL IN
11	XADCLK	O	AD CLOCK OUT
12	GND	—	GND
13,14	VCC	—	5V IN
15	GND	—	GND
16	XADSII	O	AD A/II CLOCK OUT
17	XXCKI	I	MASTER CLOCK IN 28.6 MHz
18	XFCKO	O	SENSOR CLOCK
19	XSCKO	O	INTERNAL XCK/2 CLOCK OUT
20	XVCOIN	I	PAL VCXO IN 17.7 MHz
21	XVCOIIOUT	O	PHASE DETECTOR OUT
22	XPDVIN	I	Phase Detector Comparison Input
23	XPDOUT	O	PHASE DETECTOR OUT

Pin No.	Signal name	I/O	Function
24	XPDRIN	I	PHASE DETECTOR TEF IN
25	XREFIIOUT	O	PHASE DETECTOR TEF PULSE
26	XSRES	I	RESET IN
27,28	TEST 0,TEST 1	I/O	TEST PORT
29	XMCKI	I	TG XCK/2 CLOCK IN
30	XCP1	O	OBCP OUT
31	XCP2	O	ENCP OUT
32	XTGIIDX	O	TIMING GENERATOR IID OUT
33	XTGVDX	O	TIMING GENERATOR VD OUT
34	XPBLK	O	PRE BLANKING PULSE OUT
35~42	XESRCIN7~XESRCIN0	I	R-Y, B-Y IN

Pin No.	Signal name	I/O	Function
43	GND	—	GND
44	VCC	—	5V IN
45	VCC	—	5V IN
46	GND	—	GND
47	XESRHD	O	MOTION CONPENSATION HD
48	XESRVD	O	MOTION CONPENSATION VD
49	XESRCBLK	O	MOTION CONPENSATION C BLK OUT
50	XESR C SYNC	O	MOTION CONPENSATION C SYNC OUT
51	XESR C FCK	O	MOTION CONPENSATION FCK
52	XDRBI DOUT	O	R-Y, B-Y ID PULSE
53	XESR C OUT3	O	R-Y, B-Y OUT
54	XESR C OUT2	O	R-Y, B-Y OUT
55	XESR C OUT1	O	R-Y, B-Y OUT
57	XFSC	O	—
58	XLSW	O	PAL LINE SW

Pin No.	Signal name	I/O	Function
59	XCDACLK	O	C SIGNAL D/A CLOCK
60,61	XCOUT 7, XCOUT 6	O	—
62	GND	—	GND
63	VCC	—	5V IN
64	VCC	—	5V IN
65	GND	—	GND
66~71	XCOUT 5~XCOUT 0	O	C OUT
72~79	XYOUT 7~XYOUT 0	O	Y OUT
80	XYDACLK	O	Y SIGNAL D/A CLOCK
81~83	TEST 2~TEST 4	I/O	TEST PORT
84	XPADRDATA	I	MICON I/F
85	XPST	I	MICON I/F
86	XPSCK	I	MICON I/F
87	GND	—	GND
88	VCC	—	5V IN
89	VCC	—	5V IN
90	GND	—	GND
91~100	XAFOUT 9~XAFOUT 0	O	AF, AE Y OUT

• **IC241 (CXD1177Q)**

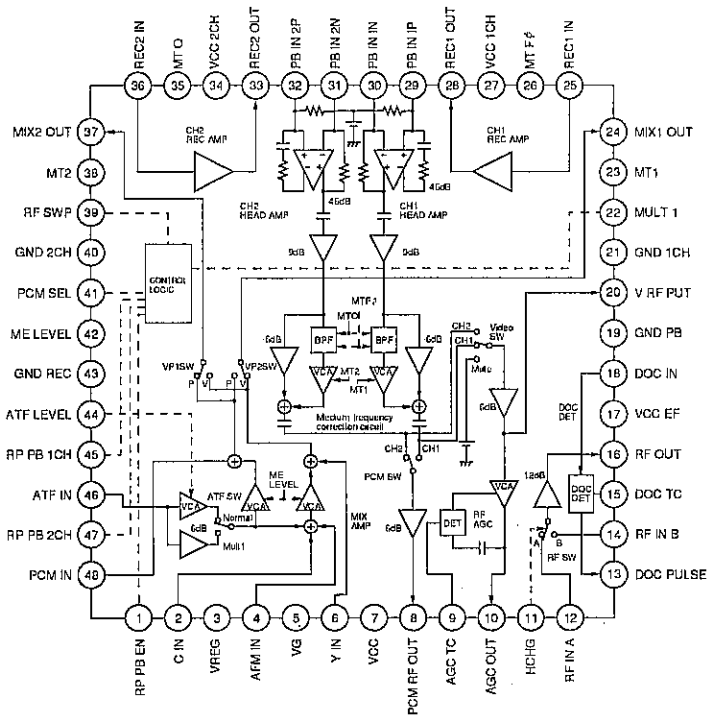


FUNCTIONS OF PINS

Pin No.	Signal name	Function
1~8	Y0~Y7	Y digital input
9~16	C0~C7	C digital input
17	BLK	Blanking terminal H: No signal (0V output), L: Signal output
18	$\overline{CE}$	Chip enable terminal H: No signal (0V output) for minimum power consumption
19	YCK	Clock terminal
20	CCK	Clock terminal
21	DVSS	Digital ground
22	VB	—

Pin No.	Signal name	Function
23	AVSS	Analog ground
24	IREF	—
25	VREF	—
26	$\overline{CO}$	Camera C inverted signal
27	CO	Camera C signal
28	$\overline{YO}$	Camera Y inverted signal
29	YO	Camera Y signal
30	VG	—
31	AVDD	Analog Vdd
32	DVDD	Digital Vdd

• IC301 (CXA1202R)
Block diagram and pin arrangement



Medium-frequency correction circuit

FUNCTIONS OF PINS

Pin No.	Signal name	I/O	Function
1	RP PB EN	I	Power-saving recording at L level. H: Above 3V, L: Below 1V
2	C IN	I	Chroma signal input terminal.
3	VREG	O	Vreg 4.2V output terminal.
4	AFM IN	I	AFM signal input terminal.
5	VG	O	Virtual ground output terminal.
6	Y IN	I	Y signal input terminal.
7	VCC	I	Power terminal for circuits but the recording amplifier and head amplifier.
8	PCM RF OUT	O	Playback PCM signal output terminal.
9	AGC TC	—	Time constant terminal for RF AGC envelope detection.
10	AGC OUT	O	Playback video signal AGC output terminal.
11	HC HG	I	RF switching control signal input terminal. H(above 3V): RF IN A selected. L (below 0.3V): RF IN B selected.
12	RF IN A	I	RF switch/12-dB amplifier input terminal.
13	DOC PULSE	O	Dropout detection signal output terminal. H level with dropout.
14	RF IN A	I	RF switch/12-dB amplifier input terminal.
15	DOC TC	—	Time constant terminal for dropout detection.

Pin No.	Signal name	I/O	Function
16	RF OUT	O	Output terminal of HCHG selected signal for RF IN A and RF IN B.
17	VCC EF	I	AGC OUT/DOC TC/RF OUT emitter following power terminal.
18	DOC IN	I	Dropout detection input terminal.
19	GND PB	—	Medium-frequency correction circuit (RF AGC/DOC DET) grounding terminal.
20	VRF OUT	O	Playback video signal input terminal.
21	GND ICH	—	CH1 recording amplifier/CH1 head amplifier grounding terminal.
22	MULTI	I	Multi-channel PCM recording mode at H level.
23	MT1	I	CH1 medium-frequency correction circuit boost level adjustment terminal. Variable from 0 to +12 dB at 4.2-0.8V.
24	MIX1 OUT	O	CH1 mixing circuit output terminal.
25	REC1 IN	I	CH1 recording amplifier input terminal.
26	MT Fø	I	Medium-frequency correction circuit fo adjustment terminal. Resistor connected to GND to control fo by current.
27	VCC 1CH	I	CH1 recording amplifier/CH1

FUNCTIONS OF PINS

Pin No.	Signal name	I/O	Function
29	PB IN 1P	I	CH1 head amplifier positive phase input terminal.
30	PB IN 1N	I	CH1 head amplifier negative phase input terminal.
31	PB IN 2N	I	CH2 head amplifier negative phase input terminal.
32	PB IN 2P	I	CH2 head amplifier positive phase input terminal.
33	REC2 OUT	O	CH2 recording amplifier output terminal.
34	VCC 2CH	I	CH2 recording amplifier/CH2 head amplifier power terminal.
35	MT Q	I	Medium-frequency correction circuit Q adjustment terminal. Resistor connected to GND to control Q by current.
36	REC2 IN	I	CH2 recording amplifier input terminal.
37	MIX2 OUT	O	CH2 mixing circuit output terminal.
38	MT2	I	CH2 medium-frequency correction circuit boost level adjustment terminal. Variable from 0 to +12 dB at 4.2-0.8V.
39	RF SWP	I	Channel-selecting RF switching pulse input terminal.
40	GND 2CH	—	CH2 recording amplifier/CH2 head amplifier grounding terminal.
41	PCM SEL	I	PCM area input terminal. H: PCM recording period. After-recording period at H level: Playback video output muted.
42	ME LEVEL	I	Low-frequency recording signal (chroma, FM and video pass ATF) level to be boosted by 0-3 dB by the voltage (0-5V) given to this terminal.
43	GND REC	—	VG/VREG/LOGIC mixing circuit grounding terminal.
44	ATF LEVEL	I	ATF signal's recording level to be boosted by 0-3 dB by the voltage (0-5V) given to this terminal. 6-dB amplifier given priority in multi-PCM mode.
45	RP PB 1CH	I	CH1 REC/PB switching signal. H: PB, L: REC With RP PB EN terminal at L level, H: Power saving recording and L: REC.
46	ATF IN	I	ATF pilot signal input terminal.
47	RP PB 2CH	I	CH2 REC/PB switching signal. H: PB, L: REC With RP PB EN terminal at L level, H: Power saving recording and L: REC.
48	PCM IN	I	PCM signal input terminal.

- **IC401 (VHiCXA1700R-1)**
  (8MM VCR LUMINANCE/CHROMA SIGNAL PROCESSING)

FUNCTIONS OF PINS

Pin No.	Signal name	Function
1	C ENPH CONT	Chroma emphasis center frequency adjustment.
2	MAIN EMPH OUT	Main emphasis/main deemphasis time constant terminal.
3	MAIN EMPH TC	Main emphasis/main deemphasis time constant terminal.
4	SUB EMPH TC	Sub-emphasis/sub-deemphasis time constant terminal.
5	EMPH IN	Y emphasis input terminal for recording. Original signal fed to noise canceler at playback.
6	NCTC IN	Noise canceler external high-pass filter connection terminal.
7	DEMOD OUT	FM-demodulated Y signal output.
8	REC C OUT	Low-frequency conversion chroma signal output for recording.
9	COMP TC	External time constant terminal for W/D clip circuit at playback.
10	DEEMPH IN	Deemphasis circuit input terminal at playback.
11	VG1	Internal reference voltage.
12	C TRAP	Playback chroma signal input.
13	LIMC	Playback Y signal comb filter block's external limiter connection terminal.
14	Y COMB OUT	Output terminal for Y signal processed by comb filter.
15	COMB ADJ	VCA gain adjustment terminal for comb filter block.
16	AGC TC 3	VCA circuit time constant terminal for comb filter block.
17	NC	Connected to GND.
18	CLAMP TC 3	Feedback clamp circuit time constant terminal for comb filter block.
19	DL OUT 2	Input terminal for CCD delay output signal going to VCA circuit.
20	CLAMP TC2	Feedback clamp circuit time constant terminal for comb filter block.
21	DL OUT 1	Input terminal for CCD delay output signal going to VCA circuit.
22	AGC TC 2	VCA circuit time constant terminal for comb filter block.
23	DL IN1	Output terminal for CCD delay input.
24	COMP SYNC	Composite sync signal output terminal.
25	VCC	Main block power terminal.

FUNCTIONS OF PINS

Pin No.	Signal name	Function
26	DDS/MASK	DDS (Date Display System) character and background signals' timing pulse input terminal.
27	WDC	White clip/dark clip level adjustment terminal.
28	V IN 2	Video signal input terminal.
29	AGC TC 1	AGC circuit time constant terminal for I/O block.
30	V IN 1	Video signal input terminal.
31	REC/JVD	REC level adjustment terminal. Input terminal for jog VD pulse at playback.
32	Y IN	Video signal input terminal.
33	CLAMP TC 1	Feedback clamp circuit time constant terminal for I/O block.
34	Y OUT	I/O block signal output terminal.
35	V OUT GND	Video output circuit grounding terminal.
36	VIDEO OUT	Video output 75-ohm driver's output terminal.
37	INV IN	Video output 75-ohm driver's vertical sag correction inverted input terminal.
38	RF/V VCC	Video output circuit/RF block power terminal.
39	Y RF IN	FM-modulated Y signal output terminal at recording.
40	RF GND	RF line grounding.
41	Y RF IN	Input terminal for Y RF signal going to FM demodulation circuit at playback.
42	SMEAR CONT	High-luminance smear correction control terminal at recording.
43	DEV CONT	Y FM modulation deviation adjustment terminal at recording.

Pin No.	Signal name	Function
44	CARR CONT	Y FM modulation carrier adjustment terminal at recording.
45	PB C IN	Chroma RF signal input terminal at playback.
46	SWP	Head switching pulse input terminal.
47	CS	Chip select terminal.
48	SI	Serial input terminal.
49	SK	Clock terminal.
50	D. O. PULSE	Dropout pulse input terminal.
51	APC FL	APC external filter connection terminal.
52	AFC FL	AFC external filter connection terminal.
53	EXT C IN	Chroma signal input at recording.
54	DCFB	Adjustment-free VCO external filter connection terminal.
55	I REF	External reference power supply terminal.
56	GND	Main block grounding.
57	XTAL IN	Crystal oscillation reference input terminal.
58	V REG	4.1V regulator output terminal.
59	X TAL OUT	Crystal oscillation reference output terminal.
60	CAM FSC SHP	Sub-carrier input terminal at camera recording. Picture adjustment terminal at playback.
61	FSC OUT	Sub-carrier output terminal for VXO/XO output through low-pass filter.
62	BF VCO	Test burst flag/VCO output terminal.
63	C OUT	Chroma signal output terminal after Y/C separation at recording.
64	C IN	Chroma signal input terminal for Y/C mixing circuit of I/O block.

• IC501 (iX0179TA)

FUNCTIONS OF PINS

Pin No.	Pin name	Signal name	I/O	Function
1	RES	RES	I	Reset input
2	XTAL	XTAL	I	12-MHz crystal connection terminal
3	EXTAL	EXTAL	I	12-MHz crystal connection terminal
4	MD1	MD1	I	Mode terminal (single-chip mode at H)
5	MD0	MD0	I	Mode terminal (single-chip mode at H)
6	NM1	VCC	I	NM1 fixed at H ▲1
7	STBY	STBY	I	Hardware standby mode input terminal (fixed at H)
8	VCC	VCC	—	Power
9	SCK0	SIO CLK	I	Serial transfer clock output (system controller common for self-adjusting models)
10	RXD0	SYS TO CAM	I	Serial transfer data input (system controller common for self-adjusting models)

Pin No.	Pin name	Signal name	I/O	Function
11	TXD0	CAM TO SYS	O	Serial transfer data output (system controller common for self-adjusting odels)
12	VSS	GND	—	Grounding
13	P9_7	LCK	O	Digital auto LSI data latch clock (leading edge)
14	ø	mclk	O	Blur microcomputer clock output (6 MHz)
15	P9_5	MRST	O	Blur microcomputer reset output
16	P9_4	CNTS	O	Standard/still switching signal output
17	P9_3	CNTM	O	Standard/blur switching signal output
18	IRQ0	TMNG	I	Timing signal input terminal (from digital auto LSI)
19	IRQ1	READY	I	Serial transfer ready input (system controller common for self-adjusting models)

FUNCTIONS OF PINS

Pin No.	Pin name	Signal name	I/O	Function
20	P9_0	VDFN	I	AF integrating field signal input (VD or VD3)
21	P6_0	F SPEED A1	O	— ▲1
22	P6_1	F SPEED A2	O	— ▲1
23	P6_2	F SPEED B1	O	— ▲1
24	P6_3	F SPEED B2	O	— ▲1
25	P6_4	NTSC/PAL	I	NTSC/PAL selection (H: NTSC, L: PAL) ▲1
26	P6_5	NGM	I	Blur correction NG input
27	P6_6	VCC	I	Not used ▲1
28	IRQ7	FI	I	Field index ▲1
29	AVCC	AVCC	—	Analog power
30	AN0	ZOOM SW	I	Zoom switch input
31	AN1	FOCUS SW	I	Manaul focus switch input (for testing)
32	AN2	PHIR F	I	Focus motor photointerruptor input
33	AN3	ADJ SW	I	Adjustment mode switch input
34	AN4	HALL IN	I	Hall element input
35	AN5	PHIR Z	I	Zoom motor photointerruptor input
36	DA0	F SPEED DA0	O	Focus speed control DA0 ▲5
37	DA1	F SPEED DA1	O	Focus speed control DA1 ▲5
38	AVSS	GND	—	Grounding
39	P4_0	—	O	NC ▲1
40	P4_1	FD2	O	Focus motor drive 2
41	P4_2	FD1	O	Focus motor drive 1
42	P4_3	FC	O	Focus motor chip select
43	P4_4	Z SPEED	O	Zoom speed (H: Low speed, L: High speed)
44	P4_5	ZD2	O	Zoom motor control 2
45	P4_6	ZD1	O	Zoom motor control 1
46	P4_7	ZC	O	Zoom motor chip select
47	VCC	VCC	—	Power
48	P2_7	AGC CLK	O	Hitachi AGC clock output
49	P2_6	AGC DATA	O	Hitachi AGC data output
50	P2_5	—	O	NC
51	P2_4	SHT STB	O	Shutter control strobe (H active) ▲1
52	P2_3	DSP STB	O	DSP data strobe (L active)
53	P2_2	DA STB	O	DA data strobe (H active)

Pin No.	Pin name	Signal name	I/O	Function
54	P2_1	CLK	O	DSP/DA/shutter serial clock
55	P2_0	DATA	O	DSP/DA/shutter serial data
56	VSS	GND	—	Grounding
57	P1_7	ADRS7	O	Digital auto LSI address set-up (parallel) BIT7
58	P1_6	ADRS6	O	Digital auto LSI address set-up (parallel) BIT6
59	P1_5	ADRS5	O	Digital auto LSI address set-up (parallel) BIT5
60	P1_4	ADRS4	O	Digital auto LSI address set-up (parallel) BIT4
61	P1_3	ADRS3	O	Digital auto LSI address set-up (parallel) BIT3
62	P1_2	ADRS2	O	Digital auto LSI address set-up (parallel) BIT2
63	P1_1	ADRS1	O	Digital auto LSI address set-up (parallel) BIT1
64	P1_0	ADRS0	O	Digital auto LSI address set-up (parallel) BIT0
65	P3_0	DATA0	I/O	Digital auto LSI data input output (parallel) BIT0
66	P3_1	DATA1	I/O	Digital auto LSI data input output (parallel) BIT1
67	P3_2	DATA2	I/O	Digital auto LSI data input output (parallel) BIT2
68	P3_3	DATA3	I/O	Digital auto LSI data input output (parallel) BIT3
69	P3_4	DATA4	I/O	Digital auto LSI data input output (parallel) BIT4
70	P3_5	DATA5	I/O	Digital auto LSI data input output (parallel) BIT5
71	P3_6	DATA6	I/O	Digital auto LSI data input output (parallel) BIT6
72	P3_7	DATA7	I/O	Digital auto LSI data input output (parallel) BIT7
73	VSS	GND	—	Grounding ▲3
74	P8_0	ROM DATA	I/O	EERPOM serial data input output ▲3
75	P8_1	ROM CLK	O	EEPROM serial clock output ▲5
76	P8_2	TEST0	O	OSD data output ▲5
77	P8_3	TEST1	O	OSD clock output ▲5
78	TXD1	TEST2	O	OSD CS output, RS-232C data output
79	P8_5	TEST3	O	Watch dog timer output
80	P8_6	VD	I	VD input ▲1

• IC506(IX0191TA)
DIGITAL AUTO IC(AUTO FOCUS/AUTO WHITE/AUTO IRIS FUNCTIONS)

DIGITAL AUTO IC PINS

Pin No.	Signal name	I/O	Function
1	CK2	O	Internal divided output, 2.3 MHz
2	CK2IN	I	Internal divided output, 2.3 MHz input
3	TA0	I	Test input
4	TA1	I	Test input
5	TA2	I	Test input
6	TA3	I	Test input
7	TA4	I	Test input
8	TA5	I	Test input
9	TA6	I	Test input
10	TA7	I	Test input
11	TA8	I	Test input
12	TA9	I	Test input
13	CLR	I	—
14	VCC	—	Power
15	GND	—	Grounding
16	DATASW	I [PU]	Switches' pass input/external input switching
17	TM0	I	Test mode
18	TM1	I	Test mode
19	IQPSW	I [PU]	WB data compression on/off
20	IQGSW	I [PU]	WB data gate on/off
21	IQN	I [PU]	WB data switching I.G/R-Y.B-Y
22	WBSW1	I [PU]	WB screen
23	WBSW0	I [PU]	WB screen
24	AFSW1	I [PU]	AF screen
25	AFSW0	I [PU]	AF screen
26	FILLN	I [PU]	AF filter switching
27	VDS3N	I [PU]	AF integrating field switching
28	VDFN	O	AF integrating field output (L active)
29	VD3N	O	VD3 dividing output (L active)
30	VD1N	O	VD inverter output (L active)
31	ADRS0	I	Interface with microcomputer, address 0
32	ADRS1	I	Interface with microcomputer, address 1
33	ADRS2	I	Interface with microcomputer, address 2
34	ADRS3	I	Interface with microcomputer, address 3
35	ADRS4	I	Interface with microcomputer, address 4
36	ADRS5	I	Interface with microcomputer, address 5
37	ADRS6	I	Interface with microcomputer, address 6
38	ADRS7	I	Interface with microcomputer, address 7
39	VCC	—	Power
40	GND	—	Grounding

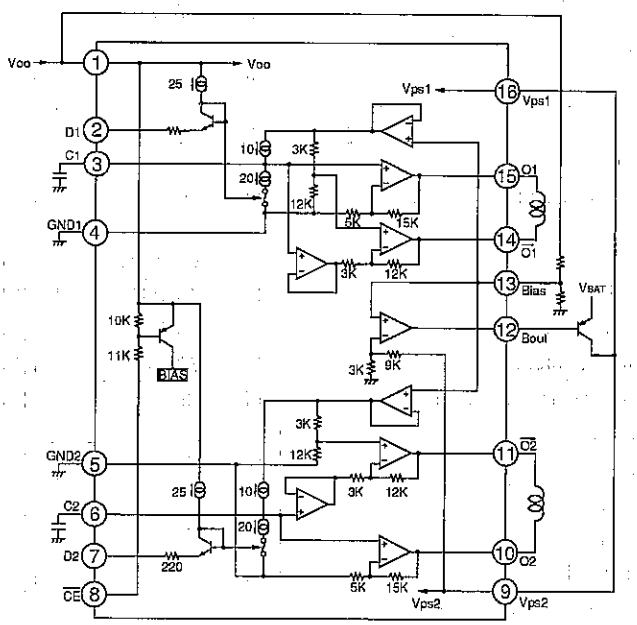
Pin No.	Signal name	I/O	Function
41	DATA0	I/O	Interface with microcomputer, data bus 0
42	DATA1	I/O	Interface with microcomputer, data bus 1
43	DATA2	I/O	Interface with microcomputer, data bus 2
44	DATA3	I/O	Interface with microcomputer, data bus 3
45	DATA4	I/O	Interface with microcomputer, data bus 4
46	DATA5	I/O	Interface with microcomputer, data bus 5
47	DATA6	I/O	Interface with microcomputer, data bus 6
48	DATA7	I/O	Interface with microcomputer, data bus 7
49	LCK	I	Data latch clock from microcomputer (leading edge)
50	TMNG	O	Data input/output timing to microcomputer
51	WGTON	I [PU]	AE center accent on/off
52	WGATSL	I [PU]	AE center accent screen switching
53	WGTSW0	I [PU]	AE center accent coefficient
54	WGTSW1	I [PU]	AE center accent coefficient
55	HDLY0	I [PU]	Delay timing for R-Y/B-Y input to Y input
56	HDLY1	I [PU]	Delay timing for R-Y/B-Y input to Y input
57	HDLY2	I [PU]	Delay timing for R-Y/B-Y input to Y input
58	HDLY3	I [PU]	Delay timing for R-Y/B-Y input to Y input
59	HDLY4	I [PU]	Delay timing for R-Y/B-Y input to Y input
60	TM4	I	Test mode
61	TM3	I	Test mode
62	TM2	I	Test mode
63	NTSCN	I [PU]	PAL/NTSC switching
64	AENEE	—	—
65	GND	—	Grounding
66	TB9	O	Test output
67	TB8	O	Test output
68	TB7	O	Test output
69	TB6	O	Test output
70	TB5	O	Test output
71	TB4	O	Test output
72	TB3	O	Test output
73	TB2	O	Test output
74	TB1	O	Test output
75	TB0	O	Test output
76	CK4	O	Internal divided output, 4.7 MHz

DIGITAL AUTO IC PINS

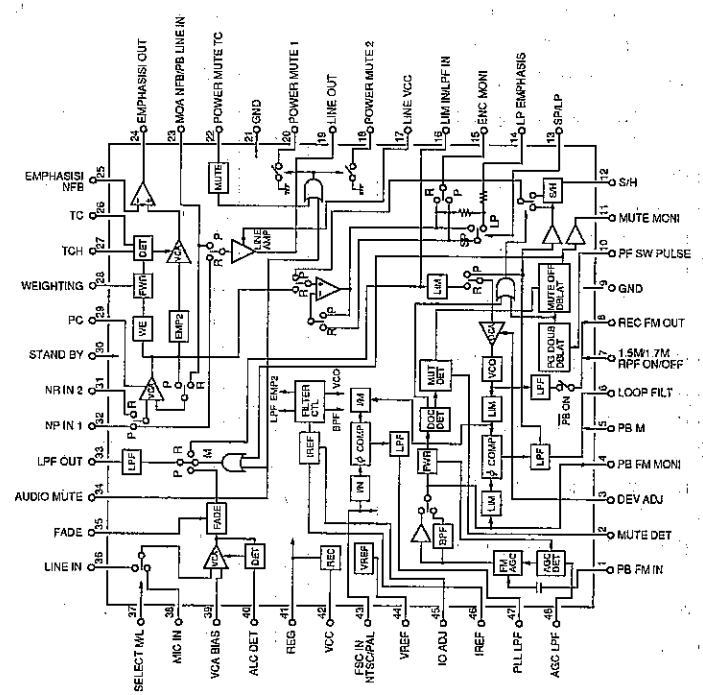
Pin No.	Signal name	I/O	Function
77	CK4IN	I	Internal divided output, 4.7 MHz input
78	AEYSW	I [PU]	AE-Y bit switching B7-B0/B8-B1
79	Y0	I	AE-Y 0
80	Y1	I	AE-Y 1
81	Y2	I	AE-Y 2
82	Y3	I	AE-Y 3
83	Y4	I	AE-Y 4
84	Y5	I	AE-Y 5
85	Y6	I	AE-Y 6
86	Y7	I	AE-Y 7
87	Y8	I	AE-Y 8
88	Y9	I	AE-Y 9

Pin No.	Signal name	I/O	Function
89	VCC	—	Power
90	GND	—	Grounding
91	FCKIN	I	Clock input
92	FCKPH	I	Clock input phase switching
93	RESOLN	I [PU]	Clock input frequency switching
94	ID	I	R-Y/B-Y sequence IC signal
95	RB0	I	R-Y/B-Y sequence 0
96	RB1	I	R-Y/B-Y sequence 1
97	RB2	I	R-Y/B-Y sequence 2
98	RB3	I	R-Y/B-Y sequence 3
99	HDN	I	HD (L active)
100	VDN	I	VD (L active)

• IC552 (MM1179XF) STEPPING MOTOR DRIVE IC



• IC602 (LA7454W) BLOCK DIAGRAM



• IC602 (LA7454W)

FUNCTIONS OF PINS

Pin No.	Signal name	Function
1	PB FM IN	Playback A FM signal input terminal. Reference input level: 30 mVp-p at A FM.
2	MUTE DET	Mute detection.
3	DEV ADJ	Deviation adjustment.
4	PB FM MONI	Playback A FM signal monitor.
5	PB H	Playback "H".
6	LOOP FILT	—
7	BPF ON/OF	Band-pass filter switch. H: 1.5M BPF on, OPEN: 1.5M BPF off, L: 1.7M BPF off.
8	REC FM OUT	Recording A FM signal output terminal.
9	GND	—
10	RF SW P.IN	Head switching pulse input terminal.
11	MUTE MONI	Mute monitor.
12	S/H	Sampling hold
13	SP/LP	SP/LP switching. H: SP, OPEN/L: LP.
14	LP EMPHSIS	Emphasis in LP mode.
15	ENC MONI	—
16	LIM IN	Limiter input terminal.
17	LINE VCC	Line amplifier power terminal.
18	POWER MUTE 2	Power mute 2 input terminal.
19	LINE OUT	Line output terminal.
20	POWER MUTE 1	Power mute 1 output terminal.
21	GND	—
22	POWER MUTE TC	Power mute time constant.
23	MOA NFB/PB LINE IN	Playback line signal input terminal.
24	EMP 1 OUT	Emphasis 1 output terminal.
25	EMP 1 NFB	Emphasis 1 negative feedback.
26	TC	Time constant.
27	TCH	—
28	WEIGHTING	Weighting.
29	PC	Power control input terminal.
30	STAND BY	Standby input terminal. H: Standby off, OPEN/L: Standby on.
31	NR IN 2	Noise reduction 2 input terminal.
32	NR IN 1	Noise reduction 1 input terminal.
33	LPF OUT	Low-pass filter output terminal.
34	AUDIO MUTE	Audio mute. H/OPEN: Mute on, L: Mute off.
35	FADE	Fade.
36	LINE IN	Line input terminal.
37	SELECT	Select switch input terminal. H: Mic, OPEN/L: Line
38	MIC IN	Microphone input terminal.
39	ALC BIAS	ALC bias.
40	ALC DET	ALC detection.
41	REC	—
42	VCC	Power input terminal.
43	FSCIN NTSC/PAL	Sub-carrier input terminal. H: NTSC, OPEN/L: PAL
44	VREF	Reference voltage.
45	IOADJ	Reference current input/output adjustment.
46	IREF	Reference current.

• IC701(RH-IX0164TAZZ)

FUNCTIONS OF PINS

*** Status of port with the microcomputer being reset (Z: High impedance)**

No.	Pin name	I/O	Type	*	Signal name	Function
1	PB3/PPO11/A3	O	cmos	Z	H-SW-P	Video head switching pulse output terminal.
2	PB2/PPO10/A2	O	cmos	Z	JOG	"H" output terminal in variable-speed playback.
3	PB1/PPO9/A1	O	cmos	Z	JOG VD H	Artificial VD output terminal in variable-speed playback.
4	PB0/PPO8/A0	O	cmos	Z	WH	LCD noiseless write control signal. H: write.
5	PC7/PTO7/D7	O	cmos	Z	REF30Hz	Servo reference signal, 30 Hz.
6	PC6/RT06/D6	O	cmos	Z	P-CON-H	Main DC/DC converter control signal. H: Power on.
7	PC5/RTO5/D5	I	Hi-z	Z	ME/$\overline{\text{MP}}$	Tape identification. H: ME tape.
8	PC4/RTO4/D4	I	Hi-z	Z	TURN SW	Face-to-face shooting mode detection switch. L: Face-to-face.
9	PC3/RTO3/D3	I	Hi-z	Z	PROTECT SW	Erase protection switch. L: Normal mode.
10	PC2/PPO2/D2	I	Hi-z	Z	SW-C	Mechanism position detection switch. L: Switch on.
11	PC1/PPO1/D1	I	Hi-z	Z	SW-B	Mechanism position detection switch. L: Switch on.
12	PC0/PPO0/D0	I	Hi-z	Z	SW-A	Mechanism position detection switch. L: Switch on.
13	PJ7	I	Hi-z	Z	CAMERA SW	Camera switch. (Standby reset)
14	PJ6	I	Hi-z	Z	EJECT SW	Eject switch. (Standby reset)
15	PJ5	I	Hi-z	Z	VTR SW	VCR switch. (Standby reset)
16	PJ4	I	Hi-z	Z	CASCON SW	Low at cassette controller switch input down. (Standby reset)
17	PJ3	I	Hi-z	Z	VTR ADJ	VCR automatic adjustment. L: Shift to automatic adjustment mode. (Standby reset)
18	PJ2	I	Hi-z	Z	CAM ADJ	Camera automatic adjustment. L: Shift to automatic adjustment mode. (Standby reset)

No.	Pin name	I/O	Type	*	Signal name	Function
19	PJ1	I	Hi-z	Z	TUN IN DET	Tuner hook-up detection switch. L: Tuner connected.
20	PJ0	O	CMOS	Z	A MUTE H	Audio output on/off. (L: On)
21	PD7/HALT	O	cmos	Z	L/M FOR	Loading motor control signal. OFF Loading UN-Loading Brake L/M FOR L H L H L/M REV L L H H
22	PD6/BRQ	O	cmos	Z	L/M REV	
23	PD5/BRK	O	cmos	Z	CAM CTL	Camera DC/DC converter control. H: Power on.
24	PD4/SYNC	O	cmos	Z	CAM READY	Serial camera ready signal. L active.
25	PD3/C	O	cmos	Z	LIM CONT	Loading motor limit control. H: Limit on.
26	PD2/R.W	O	cmos	Z	V CTL-H	Video signal output on/off. (H: On)
27	PD1/WR	O	cmos	Z	CAM REC-H	High at EE picture output in camera mode.
28	PD0/RD	O	cmos	Z	EE-L	Low at EE picture output.
29	PH7	O	Nch	Z	LINE $\overline{\text{IN}}$ /OUT	External terminal input/output switching signal. L: Input.
30	PH6	O	Nch	Z	PB-L	Low for circuit in PB mode. PNP transistor required.
31	PH5	O	Nch	Z	EEPROM CS	EEPROM chip select signal.
32	PH4	O	Nch	Z	CASSET LED	S/E sensor detection LED output. H: Drive.
33	PH3	O	Nch	Z	D/A CS	D/A converter chip select signal.
34	PH2	O	Nch	Z	ATF CS	ATF IC serial control chip select signal.
35	PH1	O	Nch	Z	OSD STB	Data strobe signal to on-screen display IC.
36	PH0	O	Nch	Z	VIDEO CS	Chip select signal to video signal processing IC.
37	MP	I	—	—	MP	Microprocessor mode select. L: Sync tip mode fixed. Grounded.
38	RST -	I	—	—	$\overline{\text{RESET}}$	Reset input. L active.
39	Vss	—	—	—	GND	—
40	XTAL	O	—	—	XTAL	System clock oscillation crystal connection terminal. Oscillationat 12MHz.
41	EXTAL	I	—	—	EXTAL	—
42	CS0-	I	—	Z	SYS 5V	Connected to Vdd.
43	SI0	I	—	Z	SLV DATA	Camera microcomputer serial data input 1 terminal.
44	SO0	O	—	Z	SYS DATA 1	System controller serial data output 1 terminal.
45	SCK0-	IO	—	Z	$\overline{\text{SLV CLK}}$	Camera microcomputer serial clock input terminal.
46	PF7/AN11	I	Hi-z	Z	TAPE START	Tape start detection voltage input. A/D input terminal.
47	PF6/AN10	I	Hi-z	Z	TAPE END	Tape end detection voltage input. A/D input terminal.
48	PF5/ AN9	I	Hi-z	Z	TUP REEL	Take-up reel pulse input. A/D input terminal.
49	PF4/AN8	I	Hi-z	Z	SUP REEL	Supply reel pulse input. A/D input terminal.
50	AVss	—	—	—	GND	A/D converter grounding terminal.
51	AVref	—	—	—	SYS 5V	A/D converter reference voltage input terminal.
52	AVdd	—	—	—	SYS 5V	A/D converter positive power supply terminal.
53	PF3/AN7	I	Hi-z	Z	BATT DET	Battery end/pre-end voltage input. A/D input terminal.
54	PF2/AN6	I	Hi-z	Z	TEST1	Adjustment test mode switch input. A/D input terminal.
55	PF1/AN5	I	Hi-z	Z	LCD LIGHT	LCD backlight life detection. (A/D input terminal)
56	PF0/AN4	I	Hi-z	Z	KEY 7	Control key input (7). A/D input terminal. STOP, REW, PB, FF, REC, PAUSE, etc.
57	AN3	I	Hi-z	Z	KEY 5	Control key input (5). A/D input terminal. PIC CTL, SEL, UP, DOWN, VOL-UP/DOWN. etc.
58	AN2	I	Hi-z	Z	KEY4	REC S/S. A/D input terminal.
59	AN1	I	Hi-z	Z	DEW	Dew sensor voltage input. A/D input terminal.
60	AN0	I	Hi-z	Z	ATF ERROR	ATF error (ATF lock error) input. A/D input terminal.
61	PG7/EXI1	I	Hi-z	Z	L/M $\overline{\text{ALARM}}$	Low input with loading motor overloaded.
62	PG6/EXI0	I	Hi-z	Z	CLOG	Clog detection signal input. H: Clogged
63	PG5/SYNC1	I	Hi-z	Z	SP/$\overline{\text{LP}}$ DET	SP/LP ID signal input for CUE/REV, etc.
64	PG4/SYNC0	I	Hi-z	Z	C-SYNC IN	Composite sync signal input. Vertical sync separator built-in.
65	PG3/PBCTL-	I	Hi-z	Z	TEST IN	Pacing check. 16-kHz output from P81 at low input.
66	PG2/DPG	I	Hi-z	Z	DRUM PG IN	Drum PG input. FRC capture input terminal.

No.	Pin name	I/O	Type	*	Signal name	Function
67	PG1/DFG	I	Hi-z	Z	DRUM FG IN	Drum FG input. FRC capture input terminal.
68	PG0/CFG	I	Hi-z	Z	CAP FG IN	Capstan FG input. FRC capture input terminal.
69	PE7/DAB1	O.	cmos	H	LCD PCON-H	LCD power on/off control. H: Power on.
70	PE6/DAB0	O	cmos	H	DRUM FWD	Drum rotation direction control signal. H: FWD.
71	PE5/DAA1	O	cmos	Z	(MON)	Test output. (Soft test terminal, land required)
72	PE4/DAA0	O	cmos	Z	DRUM D/A	DA gate pulse output terminal for drum error output.
73	PE3/PWM1	O	cmos	Z	CAP PWM	PWM output terminal for capstan error output.
74	PE2/PWM0	O	cmos	Z	SP/$\overline{LP}$	High at SP playback.
75	PE1/EC-/INT2	I	Hi-z	Z	CAP FG	Capstan FG input terminal for tape counter drive.
76	PE0/INT0	I	cmos	Z	(SYS 5V)	—
77	PI7/SI1	I	Hi-z	Z	EEPROM DI	EEPROM serial input data.
78	PI6/SO1	O	cmos	Z	OSD DATA	OSD serial data input.
79	PI5/SCK1-	O	cmos	Z	$\overline{CSD\ CLOCK}$	OSD serial clock output.
80	PI4/INT1/NM1	I	Hi-z	Z	$\overline{BATT\ OFF}$	Low: Battery off detection.
81	PI3/T0/DD0	O	cmos	Z	CLOCK OUT	16.384-kHz pulse output at power on.
82	PI2/PWM -	O	cmos	Z	TU P-CON	Tuner power on/off control. H: Power on.
83	PI1/RMC	I	Hi-z	Z	REMOCON IN	Optical remote control signal input.
84	TEX	I	—	—	TEX	Crystal connection terminal for 32-kHz timer clock oscillation.
85	TX	O	—	—	TX	—
86	Vss	—	—	—	GND	Grounding terminal.
87	Vdd	—	—	—	SYS 5V	Positive power supply terminal.
88	NC	—	—	—	SYS 5V	(Connected to Vdd)
89	PA7/PPO7/A15	O	cmos	Z	CAP ON	Capstan motor on/off control signal. H: Rotation on
90	PA6/PPO6/A14	O	cmos	Z	CAP FWD	Capstan rotation direction control signal. H: Rotation
91	PA5/PPO5/A13	O	cmos	Z	DRUM ON	Drum motor on/off control signal. H: Recording
92	PA4/PPO4/A12	O	cmos	Z	AV REC-H	Video/audio recording. H: Recording
93	PA3/PPO3/A11	O	cmos	Z	ROT ERASE	Rotary erase oscillation on/off signal. H: Oscillation
94	PA2/PPO2/A10	O	cmos	Z	PREC-H	ATF IC pilot REC/PN switching signal. H: Recording
95	PA1/PPO1/A9	O	cmos	Z	SCLOCK	Serial clock to peripheral IC Data to EEPROM, Serial data to peripheral IC D/A and ATF Y/C.
96	PA0/PPO0/A8	O	cmos	Z	SDATA	
97	PB7/PPO15/A7	O	cmos	Z	SEL 2	ATF reference pilot signal frequency selection. f1 f2 f3 f4 SEL 1 / H L H L SEL 2 / H H L L
98	PB6/PPO14/A6	O	cmos	Z	SEL 1	
99	PB5/PPO13/A5	O	cmos	Z	H-AMP-SW	H-SW 15 Hz signal (for servo test).
100	PB4/PPO12/A4	O	cmos	Z	LCD RVS	LCD switching in face-to-face mode. H: Normal

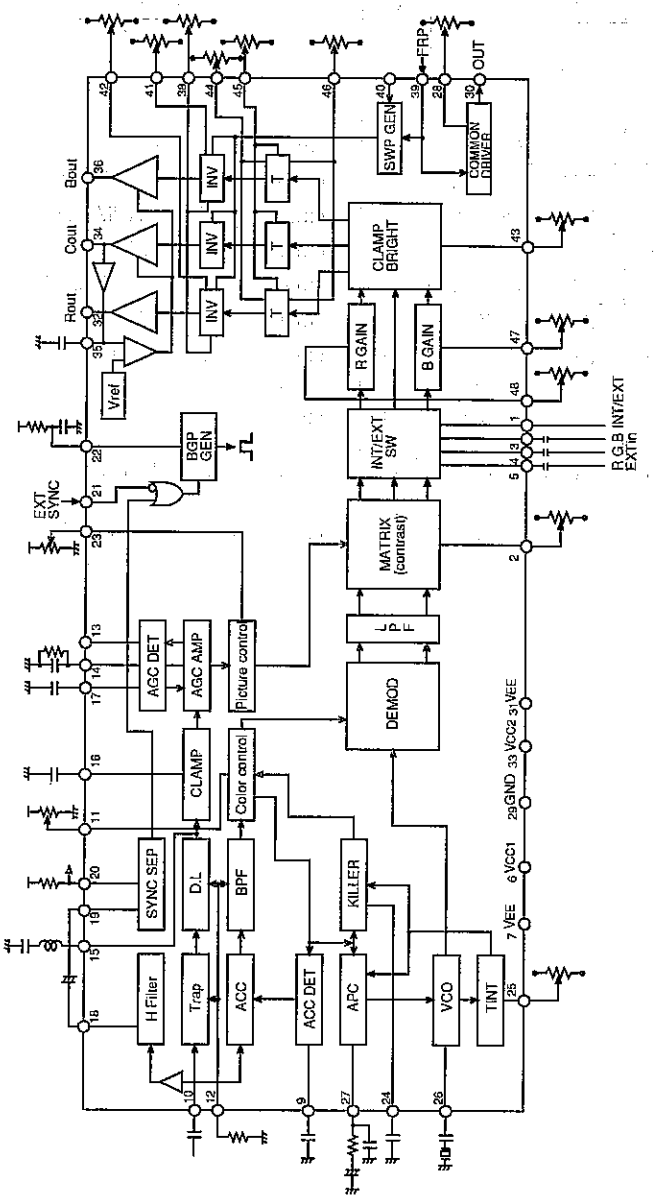
Mechanism switches A, B and C (pins 10, 11 and 12)
The mechanism position is detected as follows.

Mechanism mode	SW			Contents
	A	B	C	
END	H	H	H	T hard brake released.
EJECT	H	L	L	Cassette controller up.
BL1	H	H	H	—
USE	H	L	H	(Unskate end) Cassette controller down possible.
BL2	H	H	H	—
LOAD	H	L	L	US mechanism's middle point. Drum switched from reverse to forward rotation.
BL3	H	H	H	—
READY	L	L	H	Pinch roller off, tension regulator off.
BL4	H	H	H	—
TURN	L	H	H	Pinch roller off, tension regulator on.
BL5	H	H	H	—
R/P	L	H	L	Pinch roller on, tension regulator on.
BL6	H	H	H	—
FF	L	L	L	Pinch roller on, tension regulator semi-on.

• IC800 (IR3P90Y)

NAMES OF PINS

Pin No.	Name	Pin No.	Name
1	SW	25	TINT
2	CONTRAST	26	VCO
3	EXT IN B	27	APC FILTER
4	EXT IN C	28	CCM AMPLITUDE
5	EXT IN R	29	GND
6	VCC1	30	COM OUT
7	VEE	31	VEE
8	N.C.	32	R OUT
9	ACC FILTER	33	VCC2
10	VIDEO IN	34	G OUT
11	COLOR	35	OUT DC DET
12	F ADJ	36	E OUT
13	AGC OUT	37	N.C.
14	AGC FILTER	38	RGB AMPLITUDE
15	TRAP OUT	39	FRP
16	CLAMP	40	RGB INV
17	APL	41	SUB BRIGHT B
18	H FILTER OUT	42	SUB BRIGHT R
19	SYNC SEP	43	BRIGHT
20	SYNC OUT	44	GAMMA 2
21	SYNC IN	45	GAMMA 1
22	TIME CONSTANT	46	PEAK LIMITER
23	PICTURE	47	SUB CONTRAST B
24	KILLER FILTER	48	SUB CONTRAST R



- **IC801 IX0180TA**

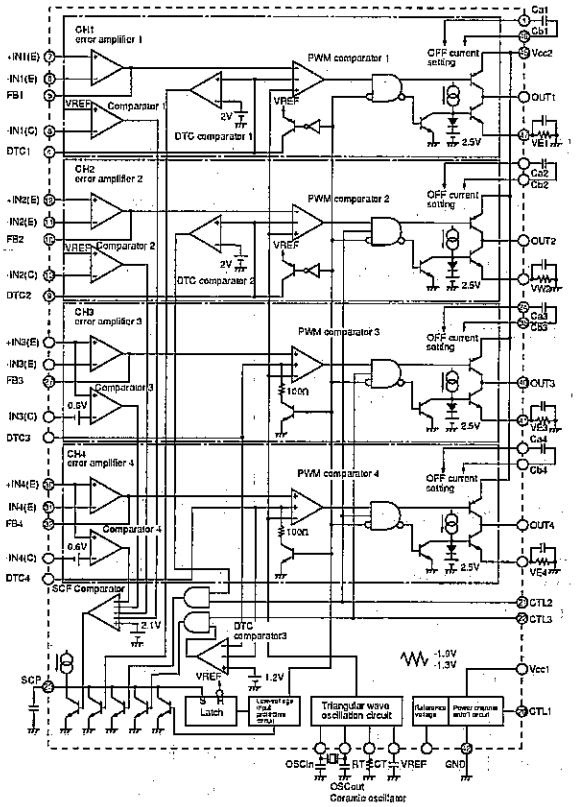
This IC is used to generate the TFT-LCD module control pulse.

Functions of pins

Pin No.	Signal name	Function
1	CVIN	Count-down vertical sync signal input (positive polarity).
2	RESH	Test terminal. Usually to be kept at high or open.
3	SYNO	Composite sync signal output (positive polarity) for vertical sync separation.
4	HRES	Test output terminal. Usually to be kept open.
5	VIN	Vertical sync signal input (positive polarity).
6	VRES	Test output terminal. Usually to be kept open.
7	GND	Grounding terminal. To be grounded.
8	RESV	Test terminal. Usually to be kept at high or open.
9	P15	SAW (pin 32) = L: Sync adjustment input. Usually to be kept at high or open. SWA (pin 32) = H: Noiseless QVD input.
10	TEST1	Test terminal. Usually to be kept at high or open.
11	CSP1	Source driver color switching signal output.
12	HSY	Horizontal sync signal output (negative polarity).
13	FRPV	Video signal polarity inversion signal output.
14	FRPC	Common electrode drive signal polarity inversion output.
15	VSY	Vertical sync signal output (negative polarity).
16	SYN1	Composite sync signal input.
17	LOWO	Gate driver low output.
18	CVD	Count-down sync signal output.
19	SPS	Gate driver start signal output.
20	CLS	Gate driver clock signal output.
21	TEST2	Test terminal. Usually to be kept at high or open.
22	WNDO	Test output terminal. Usually to be kept open.
23	SPD	Source driver start signal output.
24	CLD	Source driver clock signal output.
25	OSCO	Oscillation circuit inverter output. Oscillation circuit formed with OSCO (pin 26).
26	OSCI	Oscillation circuit inverter input. Oscillation circuit formed with OSCO (pin 25).
27	TEST3	Test terminal. Usually to be kept at high or open.
28	TEST4	Test terminal. Usually to be kept at high or open.
29	TEST5	Test terminal. Usually to be kept at high or open.
30	VCC	Power terminal. +5V input.
31	GND	Grounding terminal. To be grounded.

Pin No.	Signal name	Function
32	SWA	Noiseless drive setting terminal. H: Noiseless drive, L: Normal.
33	TVMD	TV mode setting terminal. H: NTSC system, L: PAL system.
34	EX1	Top-down inversion signal output.
35	TEST6	Test terminal. Usually to be kept at high or open.
36	PDP	PLL phase comparison output.
37	LOW1	Initial reset signal input.
38	GPS1	Gate driver power pulse output.
39	MO1	Count-down setting terminal.
40	MBKC	Spacing interval setting terminal. H: Unequal intervals, L: Equal intervals.
41	EX2	Left-right inversion signal output.
42	P16	SWA (pin 32) = L: No function. SWA (pin 32) = H: Noiseless drive write hold terminal.
43	MO2	Count-down setting terminal.
44	FIEP	Test terminal. Usually to kept at high or open.
45	HREVC	Left-right inversion setting terminal. H: Normal, L: Inversion.
46	VREVC	Top-down inversion setting terminal. H: Normal, L: Inversion.
47	BLKI	PLL phase comparison signal input. BLKO (pin 48) delay signal input.

- **IC900(MB3785V) BLOCK DIAGRAM**



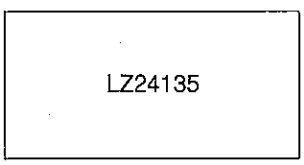
FUNCTIONS OF PINS

Pin No.		Code	I/O	Function
Channel 1	1	C1(A)	—	CH1 output transistor off current setting terminal. Capacitor connected between Ca(A) and Cb1 terminals. Output transistor off current set.
	48	Cb1	—	CH1 output transistor off current setting terminal. Capacitor connected between Ca(A) and Cb1 terminals. Output transistor off current set.
	7	+IN1(E)	I	CH1 error amplifier non-inverted input terminal.
	6	-IN1(E)	I	CH1 error amplifier inverted input terminal.
	5	FB1	O	CH1 error amplifier output terminal.
	8	-IN1(C)	I	CH1 comparator non-inverted input terminal.
	4	DTC1	I	CH1 dead time control terminal.
	47	VE1	I	CH1 output current setting terminal.
	46	OUT1	O	CH1 totem pole type output terminal.
Channel 2	3	Ca2	—	CH2 output transistor off current setting terminal. Capacitor connected between Ca2 and Cb2 terminals. Output transistor off current set.
	2	Cb2	—	CH2 output transistor off current setting terminal. Capacitor connected between Ca2 and Cb2 terminals. Output transistor off current set.
	12	+IN2(E)	I	CH2 error amplifier non-inverted input terminal.
	11	-IN2(E)	I	CH2 error amplifier inverted input terminal.
	10	FB2	O	CH2 error amplifier output terminal.
	13	-IN2(C)	I	CH2 comparator non-inverted input terminal.
	9	DTC2	I	CH2 dead time control terminal.
	43	VE2	I	CH2 output current setting terminal.
	44	OUT2	O	CH2 totem pole type output terminal.
Channel 3	34	Ca3	—	CH3 output transistor off current setting terminal. Capacitor connected between Ca3 and Cb3 terminals. Output transistor off current set.
	35	Cb3	—	CH3 output transistor off current setting terminal. Capacitor connected between Ca3 and Cb3 terminals. Output transistor off current set.
	25	+IN3(E)	I	CH3 error amplifier non-inverted input terminal.
	26	-IN3(E)	I	CH3 error amplifier inverted input terminal.

Pin No.		Code	I/O	Function
Channel 3	27	FB3	O	CH3 error amplifier output terminal.
	24	-IN3(C)	I	CH3 comparator output terminal.
	23	DTC3	I	CH3 dead time control terminal.
	41	VE3	I	CH3 output current setting terminal.
	40	OUT3	O	CH3 totem pole type output terminal.
Channel 4	36	Ca4	—	CH4 output transistor off current setting terminal. Capacitor connected between Ca4 and Cb4 terminals. Output transistor off current set.
	37	Cb4	—	CH4 output transistor off current setting terminal. Capacitor connected between Ca4 and Cb4 terminals. Output transistor off current set.
	30	+IN4(E)	I	CH4 error amplifier non-inverted input terminal.
	31	-IN4(E)	I	CH4 error amplifier inverted input terminal.
	32	FB4	O	CH4 error amplifier output terminal.
	29	-IN4(C)	I	CH4 comparator inverted input terminal.
	33	DTC4	I	CH4 dead time control terminal.
	38	VE4	I	CH4 output current setting terminal.
	39	OUT4	O	CH4 totem pole type output terminal.
Triangular wave oscillation circuit	14	OSCin	—	Ceramic oscillator connection terminal.
	15	OSCout	—	Ceramic oscillator connection terminal.
	16	RT	—	Triangular wave frequency setting resistor connection terminal.
	17	CT	—	Triangular wave frequency setting capacitor connection terminal.
Power circuit	12	Vcc1	—	Reference power/control circuit power terminal.
	45	Vcc2	—	Output circuit power terminal.
	42	GND	—	Grounding terminal.
	19	V_{REF}	O	Reference voltage output terminal.
Control circuit	23	SCP	—	Short-circuit protective circuit capacitor connection terminal (Short Circuit Protection).
	20	CTL1	I	Power/CH1 control terminal. H level: Power/CH1 in operation. L level: Standby mode
	21	CTL2	I	CH2 control terminal. CTL1 terminal = H level H level: CH2 in operation L level: CH2 off
	22	CTL3	I	CH3/CH4 control terminal. CTL1 terminal = H level CTL2 terminal = H level H level: CH3/CH4 in operation L level: CH3/CH4 off

• **IC1001(LZ24135)**

GND	ØV4	ØV3	ØV2	ØV1	PW	OFD	NC3
16	15	14	13	12	11	10	9

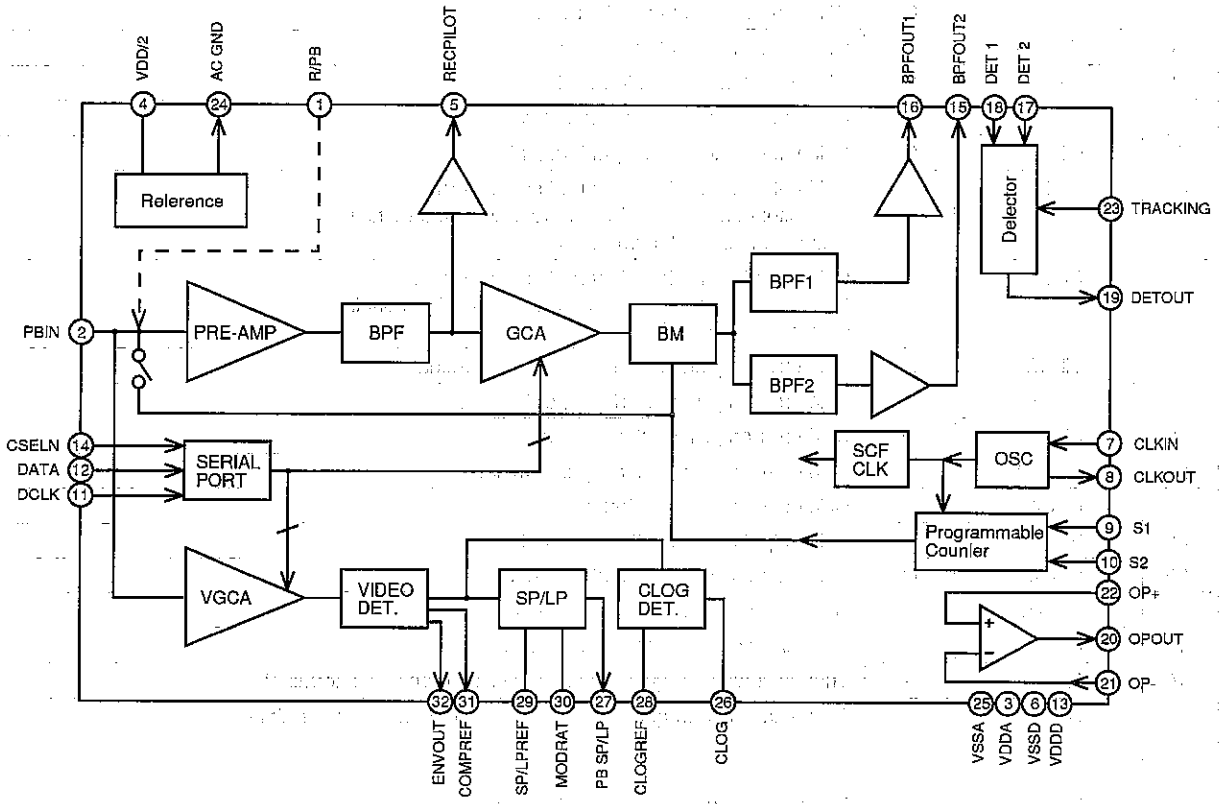


1	2	3	4	5	6	7	8
OD	ØRS	RD	OS	NC1	NC2	ØH2	ØH1

(TOP VIEW)

Pin name	Function
RD	Reset transistor drain
OD	Output transistor drain
OS	Video output
øRS	Reset transistor gate clock
øV1, øV2, øV3, øV4	Vertical shift register gate clock
øH1, øH2	Horizontal shift register gate clock
OFD	Overflow drain
PW	P well
GND	Grounding
NC1, NC2, NC3	Empty

• IC1701 (XR10813)

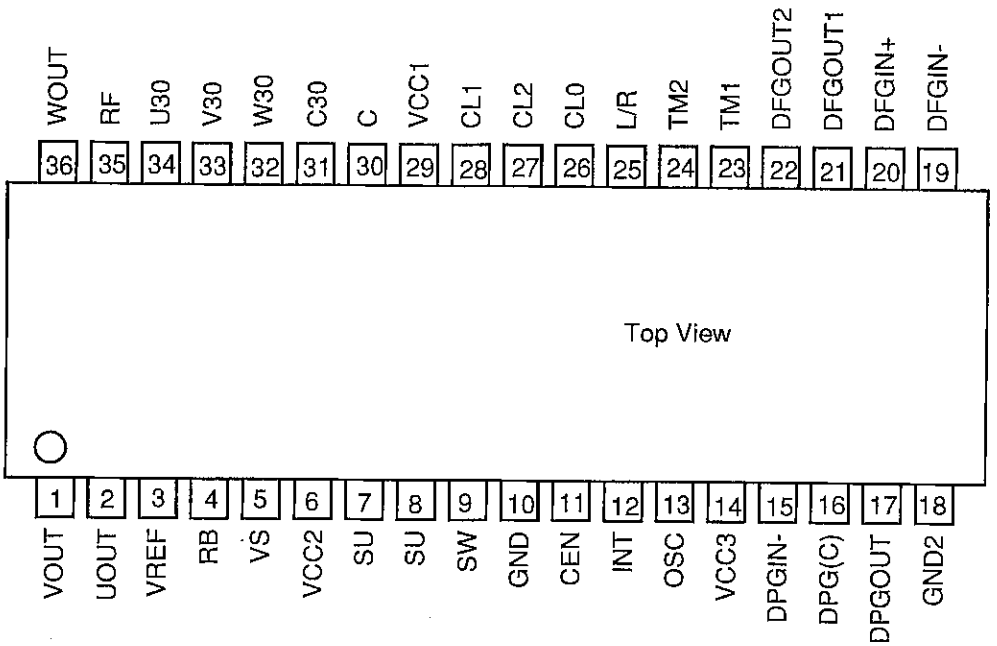


• IC1701 (XR10813)

Pin No.	Signal name	Function
1	R/PB	Record/playback control
2	PBIN	Composite video input terminal
3	VDDA	Analog VDD
4	VDD/2	Analog reference filter point
5	RECPILOT	Analog pilot signal output
6	VSSD	Digital ground
7	CLKIN	Clock input; crystal or external input
8	CLKOUT	Clock output to crystal
9	S1	F1-F4 frequency control
10	S2	F1-F4 frequency control
11	DCLK	Clock input in serial port mode
12	DATA	Data input in serial port mode
13	VDDD	Digital VDD
14	CSELN	Serial port mode enable input
15	BPF OUT2	16-kHz band-pass filter output
16	BPF OUT1	47-kHz band-pass filter output

Pin No.	Signal name	Function
17	DET2	47-kHz detector input
18	DET1	16-kHz detector input
19	DET OUT	Detector output
20	OP OUT	Operational amplifier output
21	OP-	Operational amplifier negative input
22	OP+	Operational amplifier positive input
23	TRACKING	Detector reference input voltage
24	AC GND	AC ground output
25	VSSA	Analog Vss
26	CLOG	Clog output
27	PB SP/LP	PB-SP/LP output
28	CLOG REF	Clog trip point reference
29	SP/LPREF	SP/LP trip point reference
30	MODRAT	Modulation ratio control
31	COMPREF	Video DC reference
32	ENVOUT	Video detector output

• IC1705 (LB1880M)



FUNCTIONS OF MOTOR DRIVE PINS

Pin No.	Signal name	Function
1	VOUT	Motor connection terminal (V phase)
2	UOUT	Motor connection terminal (U phase)
3	VREF	Reference voltage terminal (2.2V output voltage. Commonly used as IIL injector power. Also used as reference voltage for current limiter and thermal shut-down.)
4	RB	Resistor terminal for determining drive current by RF ratio
5	VS	Motor power voltage terminal
6	VCC2	Driver-stage power voltage terminal. Set 1 V above the VS level
7	SU	U phase drive signal terminal (Resistor added to CEN terminal. Trapezoidal wave amplitude adjustable to small.)
8	SV	V phase drive signal terminal (Resistor added to CEN terminal. Trapezoidal wave amplitude adjustable to small.)
9	SW	W phase drive signal terminal. (Resistor added to CEM terminal. Trapezoidal wave amplitude adjustable to small.)
10	GND	Motor driver grounding
11	CEN	Trapezoidal wave formed around the potential at this terminal. (About 2.2 V)
12	INT	Integrating circuit capacitor terminal for making triangular wave for trapezoidal wave formation. This terminal's constant current for charging and discharging.
13	OSC	Starting oscillation capacitor terminal. Charge/discharge voltages to be compared to generate pulses (starting counter input pulses).
14	VCC3	FG/PG amplifier line power
15	OP G IN-	PG amplifier input terminal

Pin No.	Signal name	Function
16	DP G (C)	Peak hold capacitor terminal
17	DP G OUT	PG amplifier output terminal
18	GND2	FG/PG amplifier line grounding
19	DF G IN-	FG amplifier input terminal
20	DF G IN+	FG amplifier input terminal
21	DF G OUT1	FG amplifier output terminal 1
22	DF G OUT2	FG amplifier output terminal 2
23	TM1	Start/drive switching timer charging terminal
24	TM2	Start/drive switching timer discharging terminal
25	L/R	Positive/negative switching terminal. Grounding for forward, and open or high for reverse.
26	CL0	Current limiter output terminal
27	CL2	Current limiter input terminal
28	CL1	Current limiter input terminal (Connected with RF internally)
29	VCC1	Trapezoidal wave forming circuit, reference voltage circuit
30	C	Motor's central connection terminal
31	C30	Center point's 30° filter output connection terminal
32	W30	W point's 30° filter output connection terminal
33	V30	V point's 30° filter output connection terminal
34	U30	U point's 30° filter output connection terminal
35	RF	Current feedback resistor connection terminal
36	WOUT	Motor connection terminal (W phase)

★ MARK: SPARE PARTS DELIVERY SECTION

PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by ⚠ in the Replacement Parts Lists.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. CODE

• PWB Unit ..... Not Supplied.

⚠ MARK: SAFETY RELATED PARTS

Ref. No.	Part No.	★	Description	Code
PRINTED WIRING BOARD ASSEMBLY				
	DUNTK2409PM01		Camera P.W.B.	-
	DUNTK4673HE01		VCR P.W.B.	-
	DUNTK4674HE01		CCD P.W.B.	-
	DUNTK4675HE00		MIC AMP P.W.B.	-
	DUNTK4676HE00		LI Battery Unit P.W.B.	-
	DUNTK4677HE00		Mecha P.W.B.	-
	DUNTK4678HE01		DC/DC Converter P.W.B.	-
	QSW-Z0062TAZZ		VCR Operation Unit	AM
	QSW-Z0068TAZZ		Menu Key Unit	AM
	RRMCK0003TAZZ		R/C P.W.B.	AU
TUNER AND ASSEMBLY UNITS				
	RUNTK0290TAZZ		Inverter Trans Unit	AZ
INTEGRATED CIRCUITS				
	VHiLZ24135/-1		LZ24135	BG
COIL AND TRANSFORMERS				
	PFiLW0060TAZZ		Filter	AS

Ref. No.	Part No.	★	Description	Code
DUNTK2409PM01 CAMERA P.W.B.				
INTEGRATED CIRCUITS				
IC1	VHiLZ95D38/-1		I.C.	AP
IC2	VHiCXD1250N-1		CXD1250N	AS
IC3	VHiNJ79L08U-1		NJM79L08UA	AD
IC101	VHiHA8144AF-1		HA118144AF	AP
IC102	VHiHD9306AF-1		HD49306AF	AW
IC201	RH-iX0171TAZZ		HG51B143FB	BL
IC202	RH-iX1426CEZZ		TC74HC04AF	AC
IC241	VHiCXD1177Q-1		CXD1177Q	AS
IC242	VHiTC7S08F/-1		TC7S08F	AC
IC501	RH-iX0179TAZZ		I.C.	AZ
IC502	VHiBR24C02F-1		I.C.	
IC503	VHiMB8346BV-1		MB88346BPFV	AN
IC504	VHiPST592iM-1		IC-PST592IMT	AE
IC505	VHiTCHT707F-1		TC74HCT7007AF	AD
IC506	RH-iX0191TAZZ		I.C.	
IC551, 553	VHiNJM2902V-1		NJM2902V	AD
IC552, 554	VHiMM1179XF-1		I.C.	AK
TRANSISTORS				
Q1	VSUMW1/////-1		Transistor	AB
Q2, 4, 103	VSUMX2/////-1		Transistor	AB
Q3	VS2SA1774F/-1		Transistor	AA
Q101, 108, 110, 244, 501, 558	VS2SC4617B/-1		Transistor	AA
Q102, 107, 241, 242, 243, 564, 565, 566, 567, 568, 569, 570, 571	VSUMZ1/////-1		Transistor	AB
Q106	VS2SC4627CD-1		Transistor	AB
Q109, 557, 563	VS2SB1132Q/-1		Transistor	AC
Q245	VSDTC144EE/-1		Transistor	AA
Q560	VSUMG2/////-1		Transistor	AC
Q562	VSUMT2/////-1		Transistor	AB
DIODES AND LED'S				
D1, 4,	VHDDA121///-1		Diode	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
D5, 7	VHDDA121///-1		Diode	AA
D2	VHDDA221///-1		Diode	AB
D3, 501	VHDDAP222//-1		Diode	
D6	VHDDAN222//-1		Diode	AA
D101	VHDMA715///-1		Diode	
PACKAGED CIRCUITS				
TH101	VHHNTA10338-1		Thermistor	AC
X1	RCRSZ0004TAZZ		Crystal	AS
COIL AND TRANSFORMERS				
CF501	RFiLC0052TAZZ		Filter	AE
FL1, 2, 3	RFiLN0001TAZZ		Filter	AE
L1	VPABM1R0JR82N		Peaking 1µH 5%	AC
L2, 201, 202, 241, 242, 502, 504	VPAEM100K1R3N		Peaking 10µH 10%	AC
L101, 102	VPABM100J2R6N		Peaking 10µH 5%	AC
L243	VPAEM470K5R4N		Peaking 47µH 10%	AC
L244	VPAEM680K6R9N		Peaking 68µH 10%	AC
CAPACITORS				
C1	VCKYTV1HF154Z		0.15µF 50V Ceramic	AA
C2, 3, 31, 38, 102, 104, 111, 121, 124, 245, 254, 259, 507, 512, 513, 555, 561, 562, 570	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C4, 16	VCSATE1VJ335M		3.3µF 35V Tantalum, (N.P)	
C5, 22, 209, 212, 241, 502, 503, 554	VCKYCY1EF104Z		0.1µF 25V Ceramic	AA
C7, 11, 21, 107, 109, 110, 113, 115, 117, 118, 119, 122, 125, 128, 132, 133, 201, 214, 242, 244, 511, 515, 552, 571, 580, 583	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C12, 252	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C13, 37, 40, 510	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C14, 23	VCSAPH1VJ105M		1.0µF 35V Tantalum, (N.P)	AD
C30	VCCCCY1HH6R0D		6.0pF 50V Ceramic	AA
C34, 35, 36, 45	VCCCCY1HH470J		47pF 50V Ceramic	AA
C39, 210, 211, 504, 566	VCSATA1AJ475M		4.7µF 10V Tantalum, (N.P)	AC
C101, 120	VCSATE1AJ226M		22µF 10V Tantalum, (N.P)	
C103	VCSATE1CJ106M		10µF 16V Tantalum, (N.P)	AD
C105, 213, 585, 586	VCCCCY1HH560J		56pF 50V Ceramic	AA
C106, 116, 123, 130, 202, 215, 243, 501, 506	VCSATA1AJ106M		10µF 10V Tantalum, (N.P)	
C108	VCSAPD1DJ474M		0.47µF 20V Tantalum, (N.P)	AD

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
C112, 581, 582	VCSAPD1DJ684M		0.68µF 20V Tantalum, (N.P)	AC
C114, 256	VCCCCY1HH180J		18pF 50V Ceramic	AA
C126, 127	VCCCCY1HH820J		82pF 50V Ceramic	AA
C129, 251	VCCCCY1HH150J		15pF 50V Ceramic	AA
C131	RC-CZ0008TAZZ		Capacitor	AE
C246	VCSATE0JJ156M		15µF 6.3V Tantalum, (N.P)	AE
C247, 257	VCCCCY1HH100D		10pF 50V Ceramic	AA
C248, 253	VCCCCY1HH270J		27pF 50V Ceramic	AA
C249	VCCCCY1HH220J		22pF 50V Ceramic	AA
C250, 516	VCCCCY1HH101J		100pF 50V Ceramic	AA
C255, 560, 569	VCSATE1AJ156M		15µF 10V Tantalum, (N.P)	AD
C258	VCCCCY1HH680J		68pF 50V Ceramic	AA
C553	VCSATA0JJ475M		4.7µF 6.3V Tantalum, (N.P)	AC
C563	VCKYCY1HB122K		1200pF 50V Ceramic	AA
C564, 565	VCCCCY1HH121J		120pF 50V Ceramic	AA
C567	VCKYCY1HB272K		2700pF 50V Ceramic	AA
C568	VCKYCY1CF224Z		0.22µF 16V Ceramic	AA
C572, 574, 578, 579	VCKYCY1CB273K		0.027µF 16V Ceramic	
C584	VCSATA0JJ106M		10µF 6.3V Tantalum, (N.P)	AD

RESISTORS

Ref. No.	Part No.	★	Description	Code
R1, 10, 13, 256	VRS-CY1JF105J		1.0ohm 0.063W 5% Metal Oxide	AA
R4	VRS-CY1JF274J		270k 0.063W 5% Metal Oxide	AA
R5, 30, 106, 260, 566	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R6	VRS-CY1JF271J		270 0.063W 5% Metal Oxide	AA
R7, 122	VRS-CY1JF683J		68k 0.063W 5% Metal Oxide	AA
R9, 102, 1511	VRS-CY1JF153J		15k 0.063W 5% Metal Oxide	AA
R11	VRS-CY1JF123F		12k 0.063W 1% Metal Oxide	AA
R12, 1506, 1515	VRS-CY1JF222F		2.2k 0.063W 1% Metal Oxide	AA
R17	VRK-SA1JF823J		82k 0.063W 5% Metal Composition	AB
R20	VRK-SA1JF330J		33 0.063W 5% Metal Composition	
R25	VRS-CY1JF182F		1.8k 0.063W 1% Metal Oxide	AA
R26	VRS-CY1JF682F		6.8k 0.063W 1% Metal Oxide	AA
R27, 1505, 1514	VRS-CY1JF103F		10k 0.063W 1% Metal Oxide	AA
R29, 247	VRS-CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R31, 219	VRS-CY1JF331J		330 0.063W 5% Metal Oxide	AA
R32	VRS-CY1JF561J		560 0.063W 5% Metal Oxide	AA
R33	VRK-SA1JF101J		100 0.063W 5% Metal Composition	AB
R35, 214, 215, 251, 252, 263, 264, 267, 268, 270, 509, 510, 522, 540, 1241, 1507, 1516	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R36	VRK-SA1JF102J		1.0k 0.063W 5% Metal Composition	AB
R38, 113, 200, 201, 216, 240, 503, 507, 511, 541, 543, 545, 547	VRS-CY1JF000J		00 0.063W 5% Metal Oxide	AA
R39, 118, 571, 582, 586	VRS-CY1JF682J		6.8k 0.063W 5% Metal Oxide	AA
R40, 245, 246	VRS-CY1JF104J		100k 0.063W 5% Metal Oxide	AA
R101, 104, 258, 269, 506, 530	VRS-CY1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R103, 211, 248, 271, 501,	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R502, 504, 542, 550, 562, 565, 585, 595	VRS - CY1JF103J		10k 0.063W 5% Metal Oxide	AA
R105, 218, 514	VRS - CY1JF272J		2.7k 0.063W 5% Metal Oxide	AA
R107, 108, 1521, 1524	VRK - SA1JF103J		10k 0.063W 5% Metal Composition	AB
R109	VRS - CY1JF681J		680 0.063W 5% Metal Oxide	AA
R110, 513, 516, 558, 559, 567, 596	VRS - CY1JF223J		22k 0.063W 5% Metal Oxide	AA
R111, 561, 580	VRS - CZ1JF103J		10k 0.063W 5% Metal Oxide	AA
R112, 1520	VRS - CZ1JF153J		15k 0.063W 5% Metal Oxide	AA
R114	VRS - CY1JF113J		11k 0.063W 5% Metal Oxide	AA
R120, 135, 570	VRS - CY1JF333J		33k 0.063W 5% Metal Oxide	AA
R121, 123	VRS - CY1JF224J		220k 0.063W 5% Metal Oxide	AA
R124	VRS - CY1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R125, 259	VRS - CY1JF182J		1.8k 0.063W 5% Metal Oxide	AA
R126, 568	VRS - CY1JF471J		470 0.063W 5% Metal Oxide	AA
R127	VRS - CY1JF273J		27k 0.063W 5% Metal Oxide	AA
R128, 578, 579	VRS - CZ1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R129	VRS - CY1JF820J		82 0.063W 5% Metal Oxide	AA
R130, 131	VRS - CZ1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R132	VRS - CZ1JF470J		47 0.063W 5% Metal Oxide	
R133	VRS - CY1JF5R6J		5.6 0.063W 5% Metal Oxide	AA
R212, 213	VRS - CB1JF100J		10 0.063W 5% Metal Oxide	AA
R220, 517, 518, 519, 520	VRS - CY1JF101J		100 0.063W 5% Metal Oxide	AA
R222	VRS - CY1JF390J		39 0.063W 5% Metal Oxide	AA
R241, 249, 250	VRS - CY1JF473J		47k 0.063W 5% Metal Oxide	AA
R242	VRS - CY1JF393J		39k 0.063W 5% Metal Oxide	AA
R243, 244	VRS - CY1JF201J		200 0.063W 5% Metal Oxide	AA
R253, 254, 255, 257, 262, 265, 266, 508	VRS - CY1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R515, 563	VRS - CY1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R523	VRS - TV1JD000J		00 0.063W 5% Metal Oxide	AA
R535, 536, 1517	VRS - CY1JF183J		18k 0.063W 5% Metal Oxide	AA
R555	VRS - CY1JF821J		820 0.063W 5% Metal Oxide	AA
R556, 1504, 1513	VRS - CZ1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R557, 560	VRS - CY1JF124J		120k 0.063W 5% Metal Oxide	AA
R564	VRS - CY1JF912J		9.1k 0.063W 5% Metal Oxide	AA
R572	VRS - CY1JF225J		2.2ohm 0.063W 5% Metal Oxide	AA
R573	VRS - CZ1JF333J		33k 0.063W 5% Metal Oxide	AA
R574	VRS - CZ1JF393J		39k 0.063W 5% Metal Oxide	AA
R575, 576	VRS - CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R577	VRS - CY1JF180J		18 0.063W 5% Metal Oxide	AA
R581	VRS - CZ1JF821J		820 0.063W 5% Metal Oxide	AA
R583	VRS - CY1JF153F		15k 0.063W 1% Metal Oxide	AA
R584	VRS - CY1JF244F		240k 0.063W 1% Metal Oxide	AA
R587, 588	VRS - CZ1JF124J		120k 0.063W 5% Metal Oxide	AA
R589	VRS - CY1JF123J		12k 0.063W 5% Metal Oxide	AA
R590	VRS - CZ1JF123J		12k 0.063W 5% Metal Oxide	AA
R591	VRS - CY1JF391J		390 0.063W 5% Metal Oxide	AA
R592	VRS - CZ1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R593	VRK - SA1JF121J		120 0.063W 5% Metal Composition	
R1501	VRS - CZ1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R1502, 1509, 1518	VRS - CZ1JF272J		2.7k 0.063W 5% Metal Oxide	AA
R1503, 1510, 1512, 1519	VRS - CZ1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R1508	VRS - CZ1JF183J		18k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R1522	VRS-CZ1JF154J		150k 0.063W 5% Metal Oxide	AA
R1526	VRS-CZ1JF474J		470k 0.063W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
FB1, 202, 501	RBLN-0062CEZZ		Balun	AC
FB101, 201, 243, 244, 245, 246, 247	RBLN-0059CEZZ		Balun	AB
FB203, 205	RBLN-0006TAZZ		Balun	AB
FB248	RBLN-0067CEZZ		Balun	AC
P21	QPLGN0264TAZZ		Plug	AC
P22	QPLGN0263TAZZ		Plug	AB
P23	QCNCM2651TAZZ		Connector	AE
SC2	QSOCN1465TAZZ		Socket	AE
SC6	QSOCN0567TAZZ		Socket	AB
SC8	QSOCN2465TAZZ		Socket	AE
SC18	QSOCN1265TAZZ		Socket	AD
SC19	QSOCN1466TAZZ		Socket	AE
SLD4	PSLDM3178TAFW		Shield	
SLD5	PSLDM3179TAFW		Shield	

DUNTK4673HE01 VCR P.W.B.

INTEGRATED CIRCUITS

Ref. No.	Part No.	★	Description	Code
IC301	VHiCXA1202R-1		CXA1202R	AR
IC401	VHiCXA1700R-1		I.C.	
IC402	VHiCXL5502N-1		CXL5502N	
IC403, 3401	VHiBA7655AF-1		BA7655AF	
IC602	VHiLA7454W/-1		LA7454W	AT
IC603	VHiSC14S66F-1		SC14S66F	AC
IC701	RH-iX0164TAZZ		I.C.	
⚠ IC702	VHiS8420AF/-1		S-8420AF-T1	AL
IC703, 707	VHiSC7S08F/-1		SC7S08F	
IC704	RH-iX0181TAZZ		UPD6453GT-632	
IC705	VHiCA93C46J-1		CAT93C46J	AK
IC706	VHiSC7S32F/-1		SC7S32F	
IC800	VHiiR3P90Y1-1		I.C.	
IC801	RH-iX0180TAZZ		I.C.	
IC803	VHiNJM2107F-1		NJM2107F	AE
IC804, 1702	VHiNJM2904M-1		NJM2904M	AE
IC807, 5401	VHiM62352GP-1		62352GP	AQ
IC1401	VHiNJM2509V-1		NJM2509V	
IC1402	VHiNJM2285M-1		NJM2285M	
IC1701	VHiXR10813/-1		XR10813CQ	AV
IC1703	VHiNJM2902V-1		NJM2902V	AD
IC1704	VHiMPC1727V-1		I.C.	AK
IC1705	VHiLB1880M/-1		LB1880	AU
IC6401	VHiTDA7052A-1		TDA7052AT	AK
IC6501	VHiNJM4558M-1		NJM4558M	AC

TRANSISTORS

Ref. No.	Part No.	★	Description	Code
Q302, 303, 405, 417, 1406, 1407, 1703, 3402	VSXP6501///-1		Transistor	AB
Q304, 1304, 1404	VSRN1104///-1		Transistor	AA
Q305, 401, 701, 1408	VSRN2104///-1		Transistor	AA
Q402, 403, 404, 409, 435, 436, 1403, 1405, 3401, 3403, 3404, 6501, 9900, 9907	VS2SC4738Y/-1		Transistor	AA
Q406, 432, 434	VSUMD2//-///-1		Transistor	AC
Q411, 415	VS2SA1832Y/-1		Transistor	AA
Q412, 416, 801, 803, 804, 3405	VSXP4601///-1		Transistor	AB
Q433, 606	VSXP1501///-1		Transistor	AB
Q437, 1701	VSRN1102//-1		Transistor	AA
Q603	VSDTC323TK/-1		Transistor	AB
Q604, 712, 6503	VSRN4604///-1		Transistor	AB
Q715	VSXP4111///-1		Transistor	AB
Q808, 1710	VS2SD2216//-1		Transistor	AA
Q811, 812, 814	VSDTA144EE/-1		Transistor	AA
Q813, 815, 920, 6504, 9908	VSDTC144EE/-1		Transistor	AA
Q1301,	VS2SA1037KQ-1		Transistor	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
Q1303	VS2SA1037KQ-1		Transistor	AA
Q1702	VSUMT1/////-1		Transistor	AC
Q1704	VSXN4501///-1		Transistor	AB
Q1708	VS2SB1121T/-1		Transistor	AC
Q6401	VSXN4402///-1		Transistor	AC
Q6402, 6404, 6502	VSUMG2/////-1		Transistor	AC
Q6403, 9901	VS2SA1298Y/-1		Transistor	AB
Q9903	VS2SB12956/-1		Transistor	AB
Q9906	VSUMB2/////-1		Transistor	
DIODES AND LED'S				
D401, 806, 816	VHDHVM17-5/-1		Diode	AD
D601	VHDDAN222//-1		Diode	AA
D602, 603, 702, 705, 706, 804, 808	VHDMA132K//-1		Diode	AA
D701, 704	VHDMA132WK/-1		Diode	AA
D703, 818, 1402	VHDMA132WA/-1		Diode	AA
D805	RH-EX0226CEZZ		Zener Diode	AB
D809, 3401	VHDMA147///-1		Diode	AB
D1403, 1404, 1405	VHDMA133///-1		Diode	AB
D9901	RH-EX0626CEZZ		Zener Diode	AB
PACKAGED CIRCUITS				
TH401, 801	VHHNTA20234-1		Thermistor	AC
X401	RCRSC0029TAZZ		Crystal	AK
X701	RCRSC0022TAZZ		Crystal	AG
X702	RCRSC0019TAZZ		Crystal	AG
X800	RCRSC0042TAZZ		Crystal	
COIL AND TRANSFORMERS				
FL401	RCiLF0294TAZZ		Coil	AH
FL701	RCiLB0040TAZZ		Oscillation Coil	AF
FL800	RCiLi0317TAZZ		IF Coil	AE
L301, 802, 803	VP-NM100KR42N		Peaking 10μH 10%	AB
L302, 303, 304	VP-WM221K8R4N		Peaking 220μH 10%	AB
L402	VPABM220J4R1N		Peaking 22μH 5%	AC
L403, 701, 1701	VP-NM220K1R0N		Peaking 22μH 10%	AB
L404, 405, 406, 413, 800, 801, 3401, 5401, 6401	VP-NM470K2R0N		Peaking 47μH 10%	AB
L409	VPABM5R6J1R9N		Peaking 5.6μH 5%	AC
L410	VPABM180J3R6N		Peaking 18μH 5%	AC
L411	VPABM1R0JR82N		Peaking 1μH 5%	AC
L412, 1302	VPABM101J160N		Peaking 100μH 5%	AC
L603	VP-NM101K4R2N		Peaking 100μH 10%	AC
L805	VP-1M180J2R5N		Peaking 18μH 5%	AC
L806	VP-1M100J1R6N		Peaking 10μH 5%	AC
L810	VP-1M120J1R9N		Peaking 12μH 5%	AC
L1301, 3407	VPABM100J2R6N		Peaking 10μH 5%	AC
L1703, 1704	VPAEM1R0KR35N		Peaking 1μH 10%	AB
L3403, 3410	VP-1M331J260N		Peaking 330μH 5%	AC
L3404	VP-1M181J130N		Peaking 180μH 5%	AB
L3405	VPABM4R7J1R7N		Peaking 4.7μH 5%	AC
L3406	VPABM470J8R3N		Peaking 47μH 5%	AC
L3408	VP-1M471J310N		Peaking 470μH 5%	AC
L3411	VP-1M391J330N		Peaking 390μH 5%	AB
L3412	VP-1M121J9R0N		Peaking 120μH 5%	
L3413	VPABM8R2J2R3N		Peaking 8.2μH 5%	AC
CAPACITORS				
C302, 317, 319, 620, 6401	VCKYCY1CF473Z		0.047μF 16V Ceramic	AA
C303, 304, 313, 314, 318, 321, 324, 328, 333, 334, 406, 410, 418, 428, 436, 439, 440, 443, 447, 450, 453, 454,	VCKYCY1HF103Z		0.01μF 50V Ceramic	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
C463, 472, 474, 479, 480, 481, 482, 489, 606, 615, 626, 645, 646, 720, 721, 800, 801, 802, 803, 804, 805, 806, 810, 812, 819, 821, 825, 827, 843, 1407, 1408, 1411, 1414, 1415, 1417, 1419, 1420, 1421, 1701, 1704, 1707, 1771, 1772, 1776, 3401, 3406, 3409, 3410, 3411, 3412, 3418, 3425, 3426, 3427, 3428, 3429, 9900	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C305, 312, 624, 807, 808, 809, 824, 1716	VCKYCY1EB103K		0.01µF 25V Ceramic	AA
C306, 311, 710,	VCKYTV1EB104K		0.1µF 25V Ceramic	AB
C1305, 1721, 1745, 6507, 9903	VCKYTV1EB104K		0.1µF 25V Ceramic	AB
C307, 309	VCKYTV1CB224K		0.22µF 16V Ceramic	AB
C315, 460, 490, 3419	VCCCCY1HH470J		47pF 50V Ceramic	AA
C316, 403, 639	VCCCCY1HH221J		220pF 50V Ceramic	AA
C320, 323, 326, 330, 332, 442, 647, 701, 703, 705, 708, 719, 725, 828, 835, 836, 837, 838, 841, 842, 859, 862, 869, 870, 884, 885, 890, 1306, 1706, 1710, 1711, 1724, 1746, 1755, 1778, 5402	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C322, 331, 426, 467, 724, 752, 1406	VCSATA1AJ475M		4.7µF 10V Tantalum, (N.P)	AC
C325, 327, 329, 411, 416, 417, 427, 437, 449, 613, 704,	VCSATA1AJ106M		10µF 10V Tantalum, (N.P)	

Ref. No.	Part No.	★	Description	Code
C707, 757, 1703, 1751, 1783, 1784, 3407	VCSATA1AJ106M		10µF 10V Tantalum, (N.P)	
C336, 448, 470, 717, 751, 753, 1409, 1410, 1412, 1418, 1730, 1752, 1753, 1754	VCKYTV1NF105Z		1.0µF 12V Ceramic	AB
C337, 455, 850	VCCCCY1HH471J		470pF 50V Ceramic	AA
C401, 430, 853, 854, 861, 6505	VCCCCY1HH331J		330pF 50V Ceramic	AA
C402, 421, 422, 423	VCKYTV1CF474Z		0.47µF 16V Ceramic	AB
C404, 1423, 1777, 3402, 3417	VCCCCY1HH330J		33pF 50V Ceramic	AA
C405, 459	VCSATE0GJ476M		47µF 4.0V Tantalum, (N.P)	
C407, 413, 415, 420, 451, 452, 636	VCSATA0JJ106M		10µF 6.3V Tantalum, (N.P)	AD
C409, 419, 5401	VCEAPE0JW106M		10µF 6.3V Electrolytic	AB
C412, 414, 441, 446	VCSATA1AJ335M		3.3µF 10V Tantalum, (N.P)	AC
C424	VCSAPD1VJ224M		0.22µF 35V Tantalum, (N.P)	AB
C425, 832	VCSATD1AJ107M		100µF 10V Tantalum, (N.P)	
C429, 851, 1301, 1303, 1304, 1422, 3421	VCCCCY1HH101J		100pF 50V Ceramic	AA
C431, 435,	VCSAPD1CJ105M		1.0µF 16V Tantalum, (N.P)	AC
C637, 814, 817, 1748, 6508	VCSAPD1CJ105M		1.0µF 16V Tantalum, (N.P)	AC
C432	VCSAPD1DJ684M		0.68µF 20V Tantalum, (N.P)	AC
C433	VCKYCY1EB223K		0.022µF 25V Ceramic	AA
C434, 445, 471, 713, 715, 716, 726, 727, 755, 860, 867, 881, 882, 886, 891, 1307, 1722	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C438, 456	VCCCCY1HH820J		82pF 50V Ceramic	AA
C444	VCEAPE1EW335M		3.3µF 25V Electrolytic	
C457, 469, 3420	VCCCCY1HH121J		120pF 50V Ceramic	AA
C461	VCCCCY1HH680J		68pF 50V Ceramic	AA
C464, 465, 714, 3403	VCCCCY1HH271J		270pF 50V Ceramic	AA
C468, 475, 875	VCCCCY1HH391J		390pF 50V Ceramic	AA
C607, 706, 839	VCSATC1AJ476M		47µF 10V Tantalum, (N.P)	
C609, 630, 640, 641, 815, 6403, 6501, 6502, 9902	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C610, 612, 638	VCSATA0JJ475M		4.7µF 6.3V Tantalum, (N.P)	AC
C611, 616	RC-EZ0244TAZZ		Capacitor	AB
C619	VCKYCY1CF333Z		0.033µF 16V Ceramic	AA
C621	VCKYCY1HB332K		3300pF 50V Ceramic	AA
C625, 865	VCCCCY1HH560J		56pF 50V Ceramic	AA
C627, 635, 3415	VCKYCY1HB222K		2200pF 50V Ceramic	AA
C632, 813	VCSATA0GJ106M		10µF 4.0V Tantalum, (N.P)	AC
C633, 6503	VCSATE1AJ226M		22µF 10V Tantalum, (N.P)	

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
C634	VCSATE0JJ226M		22µF 6.3V Tantalum, (N.P)	AD
C642, 6404	VCKYTV1CF225Z		2.2µF 16V Ceramic	AC
C643	VCSATA1CJ225M		2.2µF 16V Tantalum, (N.P)	AC
C702, 1773	RC-CZ0009TAZZ		Capacitor	AE
C709	VCKYTQ1CB334K		0.33µF 16V Ceramic	AB
C711, 712, 3423	VCCCCY1HH180J		18pF 50V Ceramic	AA
C722, 3413, 6504	VCCCCY1HH150J		15pF 50V Ceramic	AA
C723, 822	VCCCCY1HH120J		12pF 50V Ceramic	AA
C811	VCKYCY1CF334Z		0.33µF 16V Ceramic	AA
C816	VCKYCY1EF153Z		0.015µF 25V Ceramic	AA
C818, 1302	VCCCCY1HH151J		150pF 50V Ceramic	AA
C820	VCSAPD0JJ335M		3.3µF 6.3V Tantalum, (N.P)	AC
C823	VCSAPD1DJ474M		0.47µF 20V Tantalum, (N.P)	AD
C826	VCSATE1VJ225M		2.2µF 35V Tantalum, (N.P)	
C829, 833, 6402	VCSATF1CJ336M		33µF 16V Tantalum, (N.P)	
C834	VCSATD1VJ106M		10µF 35V Tantalum, (N.P)	
C840, 855, 857	VCSATE1DJ475M		4.7µF 20V Tantalum, (N.P)	AD
C852, 856, 864, 879	VCCCCY1HH181J		180pF 50V Ceramic	AA
C858	VCKYCY1HB561K		560pF 50V Ceramic	AA
C863	VCKYCY1CF224Z		0.22µF 16V Ceramic	AA
C866	VCCCCY1HH220J		22pF 50V Ceramic	AA
C868	RC-EZ0246TAZZ		Capacitor	
C880	VCCCCY1EH561J		560pF 25V Ceramic	
C1705	VCKYCY1HB152K		1500pF 50V Ceramic	AA
C1708, 1709	VCKYCY1HB471K		470pF 50V Ceramic	AA
C1712	VCKYCY1HB472K		4700pF 50V Ceramic	AA
C1720	VCKYCY1HB682K		6800pF 50V Ceramic	AA
C1726	VCFYEC1CM104J		0.1µF 16V	AD
C1740	VCKYTV1EB683K		0.068µF 25V Ceramic	AB
C1742, 1743, 1744	VCKYCY1EB153K		0.015µF 25V Ceramic	AA
C1749	VCKYTV1EB473K		0.047µF 25V Ceramic	AB
C1750, 1774	VCSATE1CJ106M		10µF 16V Tantalum, (N.P)	AD
C1756, 1757, 1758	VCKYCY1CB333K		0.033µF 16V Ceramic	AA
C3408	VCCCCY1HH5R0C		5.0pF 50V Ceramic	AA
C3414	VCCCCY1HH3R0C		3.0pF 50V Ceramic	AA
C3424	VCCCCY1HH390J		39pF 50V Ceramic	AA
C9904	RC-CZ0010TAZZ		Capacitor	AC

Ref. No.	Part No.	★	Description	Code
RESISTORS				
R302, 313, 314, 336, 343, 443, 454, 457, 461, 484, 485, 486, 494, 637, 815, 816, 817, 847, 849, 852, 856, 1418, 1809, 1812, 1813, 1814, 3432	VRS-CZ1JF000J		00 0.063W 5% Metal Oxide	AA
R303, 727, 832, 1786, 4424, 6405, 6501	VRS-CZ1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R307, 320, 801, 883, 3438, 3441, 3442, 6504, 6509	VRS-CZ1JF273J		27k 0.063W 5% Metal Oxide	AA
R309, 318	VRS-CZ1JF202J		2.0k 0.063W 5% Metal Oxide	
R310, 317, 409, 410, 438, 440, 470, 482, 610, 629, 724, 848, 862, 866, 1306, 1707, 1716, 1717, 1806, 3410, 3411,	VRS-CZ1JF223J		22k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R3436, 4401, 4417, 4418, 4423, 4429, 6404, 6408, 9910, 9911	VRS - CZ1JF223J		22k 0.063W 5% Metal Oxide	AA
R311, 316, 321, 498, 621, 1746, 3435, 4444, 4445	VRS - CZ1JF563J		56k 0.063W 5% Metal Oxide	AA
R312, 609, 628, 1424, 1435, 1801	VRS - CZ1JF153J		15k 0.063W 5% Metal Oxide	AA
R315, 499, 605, 726, 813, 867, 884, 1729, 1818, 3425, 4403, 4416, 6510	VRS - CZ1JF473J		47k 0.063W 5% Metal Oxide	AA
R322, 323, 412, 807, 810, 1731, 1783, 1784	VRS - CZ1JF154J		150k 0.063W 5% Metal Oxide	AA
R324, 435, 465, 3405, 3407	VRS - CZ1JF182J		1.8k 0.063W 5% Metal Oxide	AA
R325, 326	VRS - CY1JF3R3J		3.3 0.063W 5% Metal Oxide	AA
R327, 335, 441, 452, 453, 1875, 4410	VRS - CZ1JF681J		680 0.063W 5% Metal Oxide	AA
R328, 330, 406, 407, 408, 415, 432, 434,	VRS - CZ1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R436, 446, 459, 460, 464, 471, 497, 603, 636, 711, 715, 717, 720, 721, 764, 770, 773, 777, 778, 781, 825, 863, 897, 1410, 1413, 1416, 1417, 1426, 1427, 1430, 1434, 1438, 1439, 1441, 1770, 1773, 1888, 3401, 3402, 3409, 3416, 3418, 3422, 3443, 4405, 4406, 4407, 4408, 4421	VRS - CZ1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R329, 332, 333, 431, 437, 444, 469, 476, 1429, 1701, 4415, 4422, 9901	VRS - CZ1JF222J		2.2k 0.063W 5% Metal Oxide	AA
R331, 475, 1305, 3408, 3414	VRS - CZ1JF221J		220 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R334, 1437, 3428, 4441, 4443, 6403, 6506	VRS-CZ1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R337, 340, 341, 425, 451, 831, 886, 889	VRS-CZ1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R338, 422, 608, 710, 741, 868, 869, 1810, 1811, 6507	VRS-CZ1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R339, 342, 803, 812, 814, 830, 833, 845, 846, 885, 1748, 1804, 1870, 1887	VRS-CZ1JF393J		39k 0.063W 5% Metal Oxide	AA
R344, 623, 790, 797, 875, 876, 1708, 1774	VRS-CZ1JF104J		100k 0.063W 5% Metal Oxide	AA
R401	VRS-CZ1JF132F		1.3k 0.063W 1% Metal Oxide	
R402	VRS-CZ1JF222F		2.2k 0.063W 1% Metal Oxide	
R403	VRS-CZ1JF122F		1.2k 0.063W 1% Metal Oxide	
R404	VRS-CZ1JF471F		470 0.063W 1% Metal Oxide	
R405, 820	VRS-CZ1JF332F		3.3k 0.063W 1% Metal Oxide	
R413, 421, 423, 606, 613, 618, 704, 705, 722, 728, 730,	VRS-CZ1JF103J		10k 0.063W 5% Metal Oxide	AA
R755, 756, 771, 772, 840, 844, 860, 861, 864, 873, 1414, 1425, 1436, 1713, 1725, 1728, 1741, 1754, 1760, 1869, 1889, 4404, 4411, 4412, 5401, 6410, 6412, 6505, 6511	VRS-CZ1JF103J		10k 0.063W 5% Metal Oxide	AA
R414, 427, 880, 1412, 1433, 1862, 3403, 6513	VRS-CZ1JF821J		820 0.063W 5% Metal Oxide	AA
R419, 420, 483, 496, 617, 806, 809, 827, 890, 1307, 1807, 6407, 9902	VRS-CZ1JF333J		33k 0.063W 5% Metal Oxide	AA
R424, 615, 627, 1408, 1442, 1714, 1732, 4425	VRS-CZ1JF682J		6.8k 0.063W 5% Metal Oxide	AA
R426	VRS-CZ1JF183F		18k 0.063W 1% Metal Oxide	
R429, 732, 858, 859, 1767, 1802, 6406	VRS-CZ1JF823J		82k 0.063W 5% Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
R430, 818, 823, 872, 874, 1443, 1705	VRS - CZ1JF105J		1.0 0.063W 5% Metal Oxide	AA
R433, 614, 706, 1409, 1415, 1428, 3406, 3423, 4402	VRS - CZ1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R439, 455, 829, 3404, 3413, 3429, 3430	VRS - CZ1JF471J		470 0.063W 5% Metal Oxide	AA
R442, 824, 1304, 1440	VRS - CZ1JF271J		270 0.063W 5% Metal Oxide	AA
R445	VRS - CZ1JF184J		180k 0.063W 5% Metal Oxide	AA
R458	VRS - CZ1JF391J		390 0.063W 5% Metal Oxide	AA
R466, 3415, 6409, 6514	VRS - CZ1JF122J		1.2k 0.063W 5% Metal Oxide	AA
R467, 620, 1730, 3437, 4426	VRS - CZ1JF183J		18k 0.063W 5% Metal Oxide	AA
R468, 898, 3419, 3420	VRS - CZ1JF331J		330 0.063W 5% Metal Oxide	AA
R472, 474	VRS - CZ1JF151J		150 0.063W 5% Metal Oxide	AA
R607, 9903	VRS - CZ1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R611	VRS - CZ1JF155J		1.5 0.063W 5% Metal Oxide	AA
R612, 625, 834, 839, 841, 842, 843, 899, 1303, 1432, 1751, 3424, 3431	VRS - CZ1JF561J		560 0.063W 5% Metal Oxide	AA
R624	VRS - CZ1JF224J		220k 0.063W 5% Metal Oxide	AA
R638, 707, 4439	VRS - TQ2BD000J		00 1/8W 5% Metal Oxide	AA
R701, 702, 716, 729, 737, 742, 743, 750, 751, 752, 753, 780, 1702	VRK - SA1JF102J		1.0k 0.063W 5% Metal Composition	AB
R708, 826, 836, 837, 838, 1780	VRS - CZ1JF101J		100 0.063W 5% Metal Oxide	AA
R709, 740, 754, 821, 1866	VRS - CZ1JF334J		330k 0.063W 5% Metal Oxide	
R725, 6502	VRS - CZ1JF123J		12k 0.063W 5% Metal Oxide	AA
R762, 799, 1727, 1782, 1785	VRK - SA1JF103J		10k 0.063W 5% Metal Composition	AB
R774, 775, 776, 879	VRS - CZ1JF333F		33k 0.063W 1% Metal Oxide	
R782, 783, 784	VRS - CZ1JF562F		5.6k 0.063W 1% Metal Oxide	
R791, 792, 793, 794, 795, 796, 1724, 1769, 1772	VRK - SA1JF104J		100k 0.063W 5% Metal Composition	AB
R800, 835, 1800, 1803	VRS - CZ1JF363J		36k 0.063W 5% Metal Oxide	
R802, 808, 811, 828	VRS - CZ1JF303J		30k 0.063W 5% Metal Oxide	AA
R804	VRS - CZ1JF163F		16k 0.063W 1% Metal Oxide	
R805	VRS - CZ1JF153F		15k 0.063W 1% Metal Oxide	
R822	VRS - CZ1JF684J		680k 0.063W 5% Metal Oxide	AA
R865, 870, 871, 1808, 6508	VRS - CZ1JF683J		68k 0.063W 5% Metal Oxide	AA
R877	VRS - CZ1JF223F		22k 0.063W 1% Metal Oxide	

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R878	VRS-CZ1JF123F		12k 0.063W 1% Metal Oxide	
R881, 882	VRS-CZ1JF564J		560k 0.063W 5% Metal Oxide	AA
R887, 888	VRS-CZ1JF100J		10 0.063W 5% Metal Oxide	AA
R896, 1712, 1747	VRS-CZ1JF394J		390k 0.063W 5% Metal Oxide	AA
R1301	VRS-CZ1JF220J		22 0.063W 5% Metal Oxide	
R1401	VRS-CZ1JF390J		39 0.063W 5% Metal Oxide	
R1402	VRS-CZ1JF330J		33 0.063W 5% Metal Oxide	
R1733	VRS-CZ1JF273F		27k 0.063W 1% Metal Oxide	
R1742, 1743, 1744	VRS-CY1JF563J		56k 0.063W 5% Metal Oxide	AA
R1745	VRS-CY1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R1752, 1753, 9900	VRS-TV1JD1R0J		1.0 0.063W 5% Metal Oxide	AA
R1764, 1805	VRS-CZ1JF124J		120k 0.063W 5% Metal Oxide	AA
R1765	VRK-SA1JF222J		2.2k 0.063W 5% Metal Composition	AB
R1771	VRS-TV1JD331J		330 0.063W 5% Metal Oxide	AA
R1819	VRS-CY1JF395J		3.9 0.063W 5% Metal Oxide	
R1868	VRS-CZ1JF121J		120 0.063W 5% Metal Oxide	
R1883	VRS-TV1JD563J		56k 0.063W 5% Metal Oxide	AA
R3412	VRS-CZ1JF272J		2.7k 0.063W 5% Metal Oxide	AA
R4442	VRS-CZ1JF622F		6.2k 0.063W 1% Metal Oxide	
R6401	VRS-TV1JD561J		560 0.063W 5% Metal Oxide	AA
R6402	VRS-TV1JD100J		10 0.063W 5% Metal Oxide	AA
R6411	VRS-TV1JD181J		180 0.063W 5% Metal Oxide	AA
R6415, 6416	VRS-TV1JD270J		27 0.063W 5% Metal Oxide	AA
R6503, 9908	VRS-CZ1JF474J		470k 0.063W 5% Metal Oxide	AA
R9904	VRS-TV1JD821J		820 0.063W 5% Metal Oxide	AA
R9905	VRS-TV1JD332J		3.3k 0.063W 5% Metal Oxide	AA
R9909	VRS-CZ1JF824J		820k 0.063W 5% Metal Oxide	
MISCELLANEOUS PARTS				
FB601, 602	RBLN-0067CEZZ		Balun	AC
FB604	RBLN-0062CEZZ		Balun	AC
P301	QCNCM2452TAZZ		Connector	AE
P703	QPLGN0263TAZZ		Plug	AB
P9901	QCNCM3852TAZZ		Connector	AF
SC46	QSOCN1865TAZZ		Socket	AE
SC301	QSOCN0948TAZZ		Socket	AD
SC601	QSOCN0965TAZZ		Socket	AD
SC602	QSOCN0953TAZZ		Socket	
SC701	QSOCN1265TAZZ		Socket	AD
SC702	QSOCN1466TAZZ		Socket	AE
SC704	QSOCN1166TAZZ		Socket	AD
SC1701	QSOCN0766TAZZ		Socket	AD
SC1702	QSOCN2847TAZZ		Socket	
SC1703	QSOCN0665TAZZ		Socket	AD
SLD3	PSLDM9286GEFW		Shield	
⚠	KLAMPV0007TAZZ		Lamp	

DUNTK4674HE01 CCD P.W.B.

TRANSISTORS

Ref. No.	Part No.	★	Description	Code
Q1001	VS2SK508///-1		Transistor	AE

CAPACITORS

Ref. No.	Part No.	★	Description	Code
C1001	VCSATE1VJ225M		2.2µF 35V Tantalum, (N.P)	
C1002, 1004, 1005, 1007	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
C1003, 1006, 1008	VCSATE1VJ335M		3.3µF 35V Tantalum, (N.P)	

RESISTORS

Ref. No.	Part No.	★	Description	Code
R1001	VRS-CY1JF220J		22 0.063W 5% Metal Oxide	AA
R1002	VRS-CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R1003	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R1004	VRS-CY1JF101J		100 0.063W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
FB1001, 1002	RBLN-0059CEZZ		Balun	AB
SC1	QSOCN1447TAZZ		Socket	AE

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
DUNTK4675HE00 MIC AMP P.W.B.				
INTEGRATED CIRCUITS				
IC6601	VHiNJM4558M-1		NJM4558M	AC
TRANSISTORS				
Q6602	VSXP6501///-1		Transistor	AB
CAPACITORS				
C6601, 6605	VCSAPD1VJ104M		0.1µF 35V Tantalum, (N.P)	AD
C6602, 6612, 6615	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C6603	VCSATE1AJ226M		22µF 10V Tantalum, (N.P)	
C6604	VCCCCY1HH331J		330pF 50V Ceramic	AA
C6610, 6611	VCCCCY1HH471J		470pF 50V Ceramic	AA
RESISTORS				
R6601	VRS-CY1JF822J		8.2k 0.063W 5% Metal Oxide	AA
R6602	VRS-CY1JF123J		12k 0.063W 5% Metal Oxide	AA
R6603	VRS-CY1JF124J		120k 0.063W 5% Metal Oxide	AA
R6604	VRS-CY1JF273J		27k 0.063W 5% Metal Oxide	AA
R6605, 6615	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA
R6606	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R6610, 6611	VRS-CY1JF244F		240k 0.063W 1% Metal Oxide	AA
R6612	VRS-CY1JF124F		120k 0.063W 1% Metal Oxide	AA
R6613	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R6614	VRS-CY1JF561J		560 0.063W 5% Metal Oxide	AA
MISCELLANEOUS PARTS				
P6601	QPLGN0263TAZZ		Plug	AB
SC5602	QSOCN0666TAZZ		Socket	AD

Ref. No.	Part No.	★	Description	Code
DUNTK4676HE00 LI BATTERY UNIT P.W.B.				
P705	QPLGN0263TAZZ		Plug	AB
CABINET PARTS				
E701	LHLDB1008GEZZ		Holder	AF
DUNTK4677HE00 MECHA P.W.B.				
MISCELLANEOUS PARTS				
SC1710	QSOCN1563TAZZ		Socket	AG
SC1711	QSOCN0658TAZZ		Socket	AE
SC1712	QSOCN0758TAZZ		Socket	AE
ZET2	PZETV0457GEZZ		Insulator	
DUNTK4678HE01 DC/DC CONVERTER P.W.B.				
INTEGRATED CIRCUITS				
IC900	VHiMB3785V/-1		MB3785APFV	AQ
IC901	VHiMB3775FV-1		MB3775PFV	AH
TRANSISTORS				
Q901, 902, 915, 961	VSFP101////-1		Transistor	AD
Q903, 907	VS2SB1302S/-1		Transistor	AD
Q906	VSDTC144EE/-1		Transistor	AA
Q908	VS2SB1121T/-1		Transistor	AC
Q917, 960	VSXP1601///-1		Transistor	AB
DIODES AND LED'S				
D900	VHDSFPB54//2E		Diode	AC
D901	VHDFC903///-1		Diode	AB
COIL AND TRANSFORMERS				
CF900	RFiLC0051TAZZ		Filter	AE
L901, 912, 961	RCiLP0183TAZZ		Coil	
L902, 905,	VP-WM2R2MR13N		Peaking 2.2µH 20%	AB

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
L913	VP-WM2R2MR13N		Peaking 2.2µH 20%	AB
L903, 907, 908, 909, 910	VP-NM100KR42N		Peaking 10µH 10%	AB
L904	VP-WM4R7MR20N		Peaking 4.7µH 20%	AB
L906, 914	RCiLP0186TAZZ		Coil	AF
L915, 916	RCiLP0187TAZZ		Coil	
L960	RCiLP0189TAZZ		Coil	AF
T900	RTRNZ0076TAZZ		Transformer	
CONTROLS				
R943	RVR-M8032TAZZ		Variable Resistor	AC
CAPACITORS				
C900, 915	VCCCCY1HH101J		100pF 50V Ceramic	AA
C901, 912, 913, 914, 917, 918	VCKYCY1HB102K		1000pF 50V Ceramic	AA
C902, 904, 910, 921, 939, 944, 957, 960, 961	VCKYTV1EB104K		0.1µF 25V Ceramic	AB
C903, 946	VCKYCY1EB103K		0.01µF 25V Ceramic	AA
C905, 911, 916	VCKYCY1EB223K		0.022µF 25V Ceramic	AA
C906, 907	VCCCCY1HH471J		470pF 50V Ceramic	AA
C908	VCCCCY1HH391J		390pF 50V Ceramic	AA
C909	VCKYTV1CF104Z		0.1µF 16V Ceramic	AA
C920, 962	VCKYCY1CF104Z		0.1µF 16V Ceramic	AA
C922, 925, 926, 937, 951, 965	RC-CZ0008TAZZ		Capacitor	AE
C924	VCKYCY1HB221K		220pF 50V Ceramic	AA
C927	VCKYCY1HB271K		270pF 50V Ceramic	AA
C928, 929, 936, 966	RC-CZ0009TAZZ		Capacitor	AE
C932, 933,	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB

Ref. No.	Part No.	★	Description	Code
C934, 935, 942	VCKYTV1CF105Z		1.0µF 16V Ceramic	AB
C938, 943	RC-CZ0010TAZZ		Capacitor	AC
C941	RC-CZ0012TAZZ		Capacitor	AE
C952	VCSATA1CJ225M		2.2µF 16V Tantalum, (N.P)	AC
C954, 964	VCKYCY1HB471K		470pF 50V Ceramic	AA
C955	VCSAPD1CJ105M		1.0µF 16V Tantalum, (N.P)	AC
C963	VCKYCY1HB331K		330pF 50V Ceramic	AA
C967	VCKYCY1HF103Z		0.01µF 50V Ceramic	AA
RESISTORS				
R900, 905, 927	VRS-CY1JF184J		180k 0.063W 5% Metal Oxide	AA
R901, 937, 962	VRS-CY1JF224J		220k 0.063W 5% Metal Oxide	AA
R902, 904, 908, 920	VRN-CY1JF472D		4.7k 0.063W 0.5% Metal Film	AA
R903	VRS-CY1JF473J		47k 0.063W 5% Metal Oxide	AA
R906	VRS-CY1JF102J		1.0k 0.063W 5% Metal Oxide	AA
R909, 970	VRS-CY1JF105J		1.0ohm 0.063W 5% Metal Oxide	AA
R910	VRS-CY1JF682F		6.8k 0.063W 1% Metal Oxide	AA
R911	VRS-CY1JF223J		22k 0.063W 5% Metal Oxide	AA
R912, 915, 925, 926, 947	VRS-CY1JF472J		4.7k 0.063W 5% Metal Oxide	AA
R913	VRS-CY1JF103J		10k 0.063W 5% Metal Oxide	AA
R914, 931	VRS-CY1JF332J		3.3k 0.063W 5% Metal Oxide	AA
R916, 924	VRS-TV1JD271J		270 0.063W 5% Metal Oxide	AA
R917, 941	VRS-TV1JD471J		470 0.063W 5% Metal Oxide	AA
R918	VRS-TV1JD221J		220 0.063W 5% Metal Oxide	AA
R919, 921	VRS-CY1JF152J		1.5k 0.063W 5% Metal Oxide	AA
R922, 963	VRS-CY1JF333J		33k 0.063W 5% Metal Oxide	AA
R928	VRS-CY1JF334J		330k 0.063W 5% Metal Oxide	AA
R929	VRS-CY1JF563J		56k 0.063W 5% Metal Oxide	AA
R930	VRS-CY1JF681J		680 0.063W 5% Metal Oxide	AA
R932	VRS-CY1JF682J		6.8k 0.063W 5% Metal Oxide	AA

★ MARK: SPARE PARTS DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
R934	VRN-CY1JF223D		22k 0.063W 0.5% Metal Film	AA
R935	VRN-CY1JF752D		7.5k 0.063W 0.5% Metal Film	AA
R936, 966	VRS-TV1JD681J		680 0.063W 5% Metal Oxide	AA
R942	VRS-CY1JF303F		30k 0.063W 1% Metal Oxide	AA
R950	VRN-CY1JF183D		18k 0.063W 0.5% Metal Film	
R951	VRN-CY1JF103D		10k 0.063W 0.5% Metal Film	AA
R952	VRS-CY1JF820F		82 0.063W 1% Metal Oxide	
R957	VRS-CY1JF562J		5.6k 0.063W 5% Metal Oxide	AA
R958	VRS-CY1JF392J		3.9k 0.063W 5% Metal Oxide	AA
R961	VRS-CY1JF564J		560k 0.063W 5% Metal Oxide	AA
R964, 972	VRS-CY1JF392F		3.9k 0.063W 1% Metal Oxide	AA
R965, 969	VRS-CY1JF103F		10k 0.063W 1% Metal Oxide	AA
R967	VRS-CY1JF273J		27k 0.063W 5% Metal Oxide	AA
R968	VRS-TV1JD331J		330 0.063W 5% Metal Oxide	AA
R974	VRS-TX2HF000J		00 1/2W 5% Metal Oxide	AA

MISCELLANEOUS PARTS

	PSLDM9288GEFW		Shield	
FB900	RBLN-0011TAZZ		Balun	
FB901, 902, 903	RBLN-0028TAZZ		Balun	
FB904	RBLN-0036TAZZ		Balun	
⚠ F900, ⚠ 901, ⚠ 902	QFS-L1621TAZZ		Fuse	AE
P36	QPLGN0463TAZZ		Plug	AC
SC9901	QCNCW3852TAZZ		Connector	AF
SC9902	QSOCN0647TAZZ		Socket	AE

RRMCK0003TAZZ R/C P.W.B.

CAPACITORS

C2701	VCEAAA1CW105M		1µF 16V Ceramic	AB
C2702	VCEAAA1CW471M		470µF 50V Ceramic	

MISCELLANEOUS PARTS

RMC701	RRMCU0004TAZZ		Remote Receiver	
SW701	QSW-S0108TAZZ		VCR/Camera Select SW	

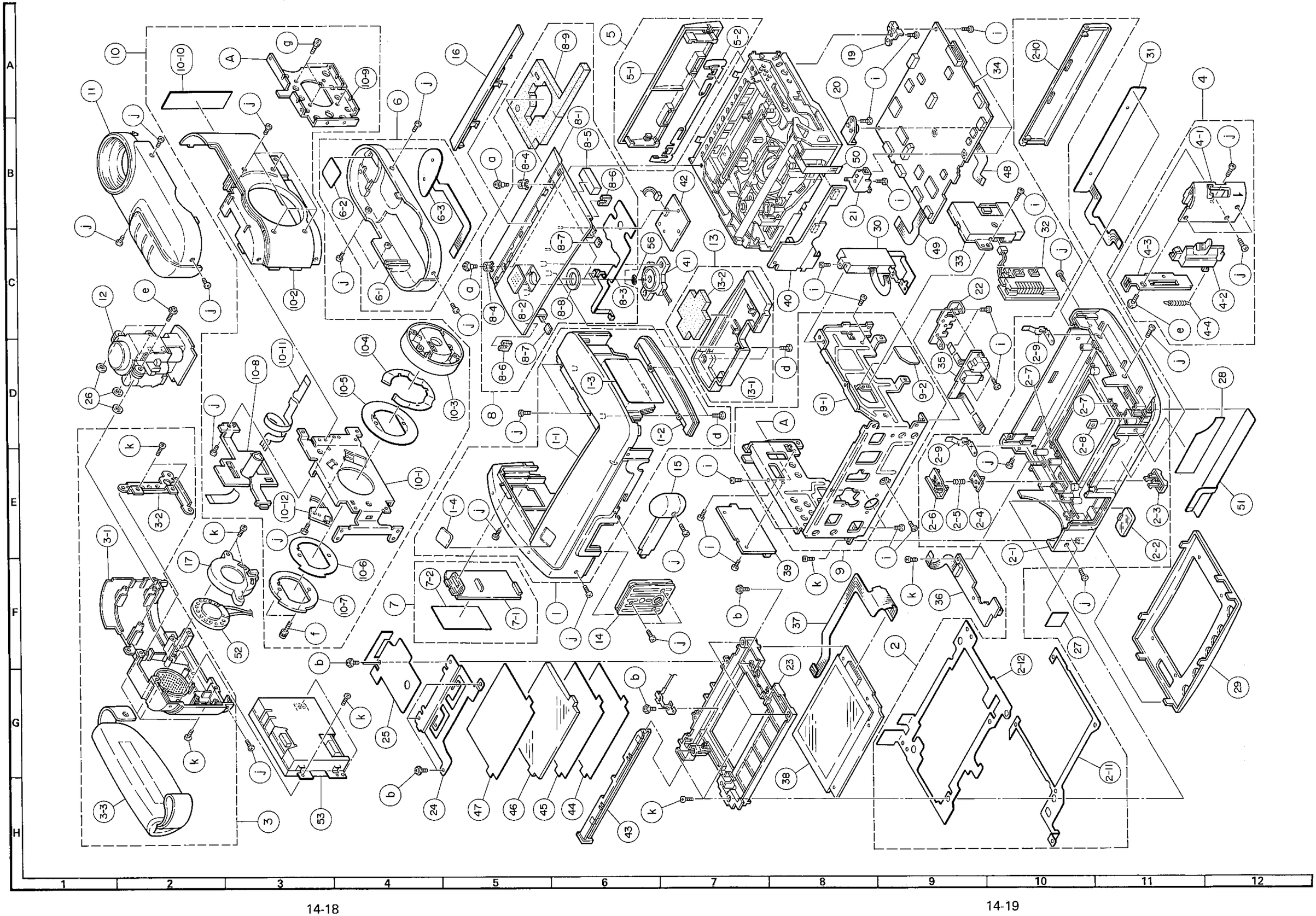
Ref. No.	Part No.	★	Description	Code
OTHERS PARTS				
	SPAKC6311TAZZ		Packing Case (VL-E30U)	
	SPAKC6312TAZZ		Packing Case (VL-E30C)	
	SPAKC6318TAZZ		Packing Case (VL-E35U)	
	SPAKC6367TAZZ		Packing Case (VL-E35)	
	SPAKP6049TAZZ		Wrapping Paper	AC
	SSAKA0002CEZZ		Polyethylene Bag	AA
	TGANE0044TAZZ		Guarantee Card (VL-E30U/E35U)	AC
	TINSE0142TAZZ		Instruction Book (VL-E30U)	AG
	TINSZ1362TAZZ		Instruction Book (VL-E30C)	AL
	TINSE0149TAZZ		Instruction Book (VL-E35U)	AF
	TINSZ1373TAZZ		Instruction Book (VL-E35)	
	TGANZ0008TAZZ		Guarantee Card (VL-E30C/E35)	
	RRMCG0017TASA		Infrared R/C	
	QCNW-1132TAZZ		AV Cable	AK
	QCNW-1140TACO		DC Cable	AU
	VSP0028P-27YB		Speaker	AN
	PNNOK0003TAZZ		Cleaning Cloth	
	RMICC0053TAZZ		Microphone	AS

CABINET PARTS LIST

★ MARK: SPARE PARTS DELIVERY SECTION

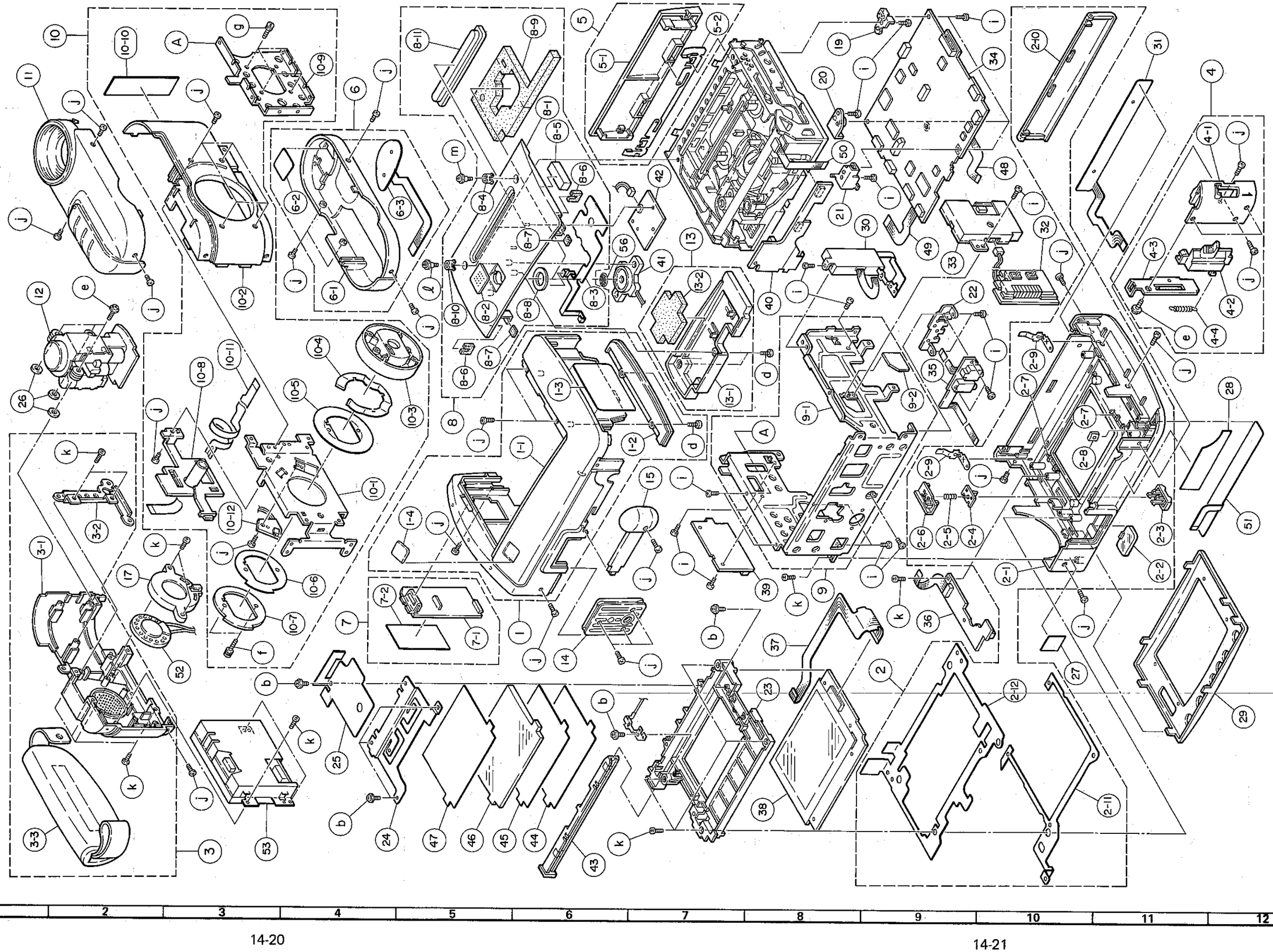
REF.NO.	PART NO.	★	DESCRIPTION	CORD
1	CCABA6096TAK1		VCR Cabinet Ass'y (VL-E30U)	AS
1	CCABA6096TAK2		VCR Cabinet Ass'y (VL-E30C)	
1	CCABA6096TAK3		VCR Cabinet Ass'y (VL-E35U/E35)	
1-2	GCOVA1290TASA		Battery Edge Cover	AB
1-3	TLABH0170TAZZ		Battery Label (VL-E30U/E35U/E35)	AA
1-3	TLABH0178TAZZ		Battery Label (VL-E30C)	
1-4	HBDGS0059TASA		LCD Batch	
2	DCABB6097TAK1		LCD Cabinet Ass'y	AW
2-2	GCOVA1287TASA		Remote Control Receptor Cover	AB
2-3	JKNBP0091TASA		Power Knob	AB
2-4	JBTN-0216TASA		Power Lock Button	AB
2-5	MSPRC0050TAFJ		Power Lock Spring	AA
2-6	LHLDZ1211TAZZ		Power Knob Holder	AB
2-7	MSPRD0021TAFJ		Protec Cover Spring	
2-8	LX-NZ0076TAFW		M2 Square Nut	AB
2-9	MSPRP0108TA00		Operating Unit Cover Spring	
2-10	GFTAT1003TAKA		Operating Unit Cover	AG
2-11	QEARZ0010TAZZ		LCD Earth Plate	
2-12	PCOVP9037TAZZ		Protec Cover	
3	DCABD6027TAK1		Camera Cabinet D Ass'y	AW
3-2	LANGT0440TAFW		Cover Angle	AC
3-3	UBNDT0067TASA		Hand Strap	
4	CCASP0050TAK1		Battery Lock Case Ass'y	AL
4-2	MLEVP0009TASA		Battery Lock Lever	AC
4-3	LANGK0290TA00		Battery Lock Angle	AD
4-4	MSPRT0022TAFJ		Battery Lock Spring	
5	CCOVA1288TAK1		Cassette Cover Ass'y (VL-E30U/C)	
5	CCOVA1288TAK2		Cassette Cover Ass'y (VL-E35U/E35)	
5-2	MSPRP0114TAFJ		Cassette Cover Spring	
6	CCOVA1296TAK1		Rear Cover Ass'y	AW
6-2	PZETV0280TAZZ		CCD Insulation Plate	
6-3	QSW-Z0069TAZZ		Camera Operation Unit	
7	CFTAB1033TA04		Lithium Cover Ass'y (VL-E30U/E35U/E35)	AD
7	CFTAB1033TA02		Lithium Cover Ass'y (VL-E30C)	AD
7-2	TLABH0179TAZZ		Lithium Interchange Label (VL-E30U/E35U/E35)	AA
7-2	TLABH0171TAZZ		Lithium Interchange Label (VL-E30C)	AA
8	CFTAC1108TAK1		Cassette Cover Ass'y (VL-E30U/C)	
8	CFTAC1111TAK1		Cassette Cover Ass'y (VL-E35U/E35)	
8-2	HDECB0225TASA		Cassette Cover Decoration Plate(VL-E30U/C)	
8-2	HDECB0225TASC		Cassette Cover Decoration Plate(VL-E35U/E35)	
8-3	QEARZ0009TAZZ		Cassette Cover Earth	
8-4	PSPAG0059TA00		Cassette Cover Cusion A	
8-5	PSPAG0060TAZZ		Cassette Cover Cusion B	
8-6	PSPAG0061TA00		Cassette Cover Cusion C	
8-7	PSPAG0062TAZZ		Cassette Cover Cusion D	
8-8	PSPAG0080TAZZ		Cassette Cover Spacer A	
8-9	PSPAG0082TAZZ		Cassette Cover Spacer B	
8-10	PSPAG0063TA00		Cassette Cover Cusion A2 (VL-E35U/E35)	
8-11	GMADC0044TASA		Cassette Wind (VL-E35U/E35)	
9	CANGF0283TA01		MH Frame Ass'y	AM
9-2	PCOVP9036TAZZ		MH Frame Cover	AA
10	CANGF0284TAK1		Tilt Ass'y	BA
10-2	GCABC6027TAKA		Camera Cabinet C	AQ
10-3	GDAi-3048TASA		Tilt Rotation Axle	
10-4	MSPRP0110TAFW		Tilt Plate Spring	
10-5	PSPAZ0073TAZZ		Tilt Rotation Section Spacer A	AB
10-6	PSPAZ0074TAZZ		Tilt Rotation Section Spacer B	AC
10-7	LANGH0052TAFW		Tilt Positioning Plate	AB
10-8	LHLDW1028TAZZ		Tilt FPC Holder	AB
10-9	LANGF0285TAFW		Tilting side fixture	AD
10-10	TLABH0168TAZZ		Video reverse caution label	AA
10-11	QPWBH2412TAZZ		Tilt FPC	AR
10-12	QSW-Z0065TAZZ		LCD Inversion Switch	
11	CCOVA1297TAK1		Front Cover Ass'y	
12	CLNSA0118TA01		Lens Ass'y	BS
13	CCOVA1291TA01		Cassette Cover Back Cover Ass'y	
13-2	PSPAZ0081TAZZ		Cassette Cover Back Cover Spacer	
14	GDAi-1038TASA		Tri Pod	AF
15	GCOVA1289TASA		Bottom Cover	AB
16	GCOVA1295TASA		Cassette Cover Screw Cover	AF
17	LHLDZ1214TAZZ		Speaker Holder	AB
19	LANGT0436TAFW		Mechanism Fixture L	AB
20	LANGT0437TAFW		Mechanism Fixture R	AB
21	LANGT0438TAFW		Mechanism Fixture B	AB
22	LANGT0439TAFW		Microphone/Earphone Fixture	AC
23	LHLDZ1212TAZZ		LCD Holder	AG
24	MSPRP0109TAFJ		Light Guide Plate Retaining Sheet Spring	
25	PZETV0277TAZZ		Lamp Terminal Insulator Sheet	
26	PSPAZ0071TA00		Lens Spacer	AA
27	TLABS0079TAZZ		UL Label (VL-E30U/E35U)	AA
28	TLABM1466TAZZ		Model Label (VL-E30U)	AA
28	TLABM1467TAZZ		Model Label (VL-E30C)	
28	TLABM1473TAZZ		Model Label (VL-E35U)	
28	TLABM1493TAZZ		Model Label (VL-E35)	
29	HDECA0667TASA		LCD Decoration Plate	
30	RUNTK0290TAZZ		Inverter Unit	AZ
31	QSW-Z0068TAZZ		Menu Operation SW Unit	
32	QTANZ0051TAZZ		System Terminal	AR
33	DUNTK4678HE01		D/D Converter Unit	—
34	DUNTK4673HE01		VCR Main PCB Unit	—
35	QJAKZ0003TAZZ		Jack FPC Unit	AR
36	RRMCK0003TAZZ		Remote Control Receptor FPC Unit	AU
37	QPWBH4682GEZZ		LCD Panel FPC	AK
38	RLCDV0009TAZZ		LCD Modul	BZ
39	DUNTK4676HE00		Lithium Battery PCB Unit	—
40	DUNTK4677HE00		Mechanism Relay PCB Unit	—
41	RMiCC0053TAZZ		Microphone Unit	AS
42	DUNTK4675HE00		Microphone Amp PCB Unit	—
43	KLMPV0007TAZZ		Lamp Unit	AY
44	PSHEP0002TAZZ		Prizom Sheet	AL
45	PSHEP0001TAZZ		Diffusion Sheet	AE
46	PGiDM0017TAZZ		Light Guide Plate	AQ
47	PMiR-0012TAZZ		Reverberation Sheet	AD
48	QPWBH4684GEZZ		Head Amp FPC	AG
49	QPWBH4693GEZZ		Capstan Motor FPC	AE
50	QPWBH4683GEZZ		Loding Motor FPC	
51	QSW-Z0062TAZZ		VCR Operation SW Unit	
52	VSP0028P-27YB		Speaker Unit	AN
53	DUNTK2409PM01		Camera Unit	—
56	PSPAH0016TA00		Spacer	
a	LX-BZ0179TAFD		Screw (M2)	
b	LX-HZ3025CEFF		Screw (M1.7-4)	AA
d	LX-HZ0008TAFF		Screw (M2-6)	AA
e	LX-HZ3037GEFD		Screw (M2)	AA
f	XBPSD26P10J00		Screw (M2.6-10)	AA
g	XBPSD26P06J00		Screw (M2.6-6)	AA
i	XiPSD20P03000		Screw (M2-3)	AA
j	XiPSF20P04000		Screw (M2-4)	AA
k	XJPSD20P06000		Screw (M2-6)	AA
l	LX-BZ0180TAFB		Screw (M2)(VL-E35U/E35 Only)	
m	LX-BZ0181TAFB		Screw (M2)(VL-E35U/E35 Only)	

CABINET EXPLODED VIEW (VL-E30U/C)



CABINET EXPLODED VIEW (VL-E35U/E35)

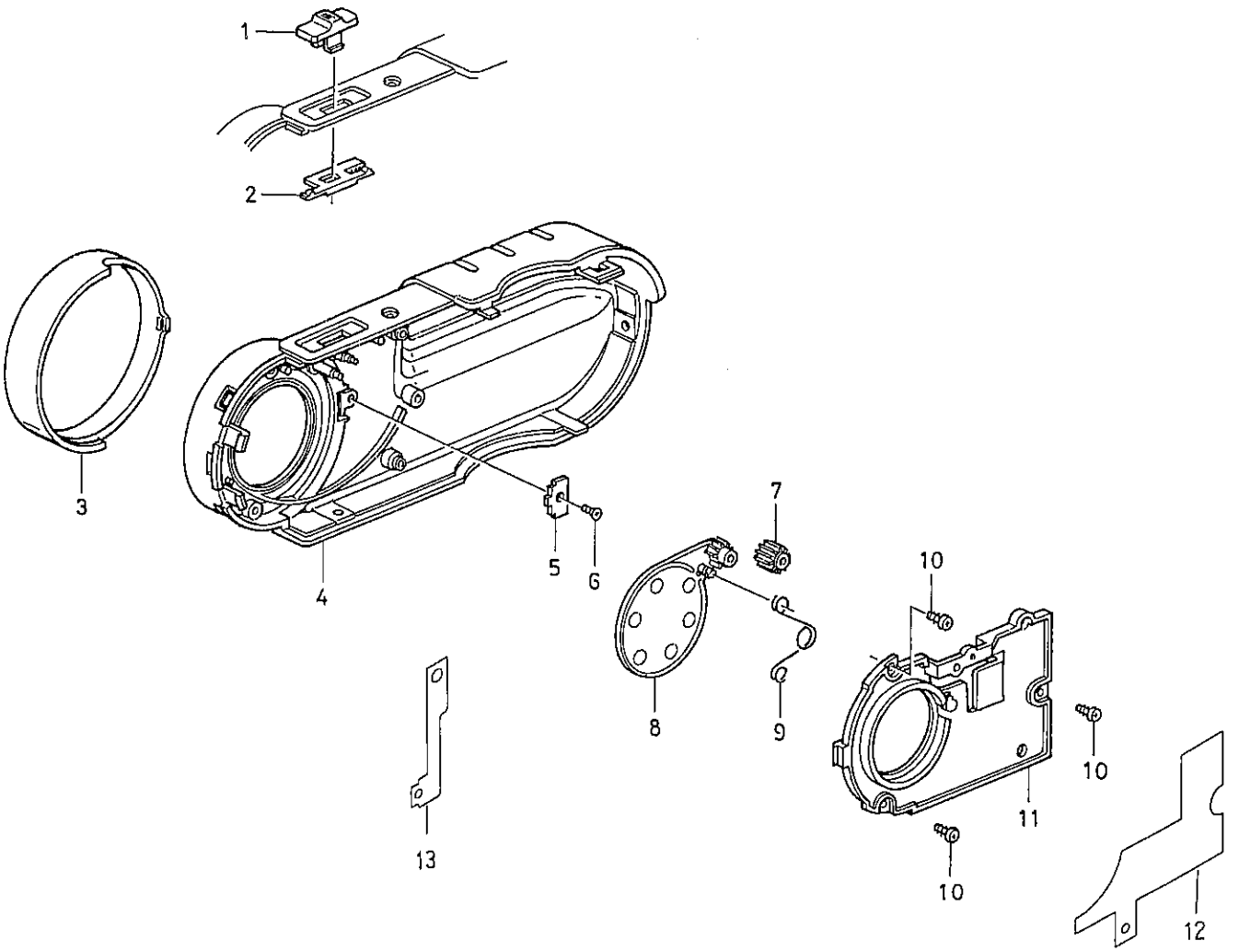
VL-E30U/C
VL-E35U/E35



FRONT COVER UNIT PARTS LIST

★ MARK: SPARE PARTS DELIVERY SECTION

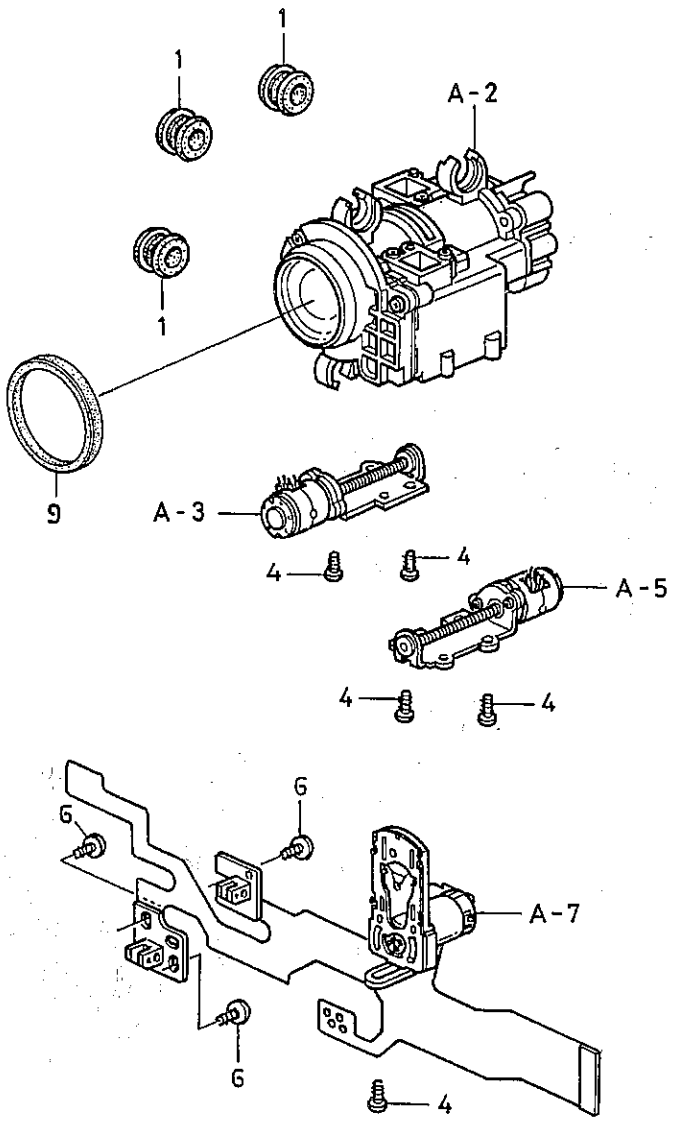
REF.NO.	PART NO.	★	DESCRIPTION	CORD	REF.NO.	PART NO.	★	DESCRIPTION	CORD
	CCOVA1297TAK1		Front Cover Ass'y		7	99JBFA516135		Pinion Gear	AC
1	99JBFA516136		Make and Break	AD	8	99JBFA516133		Shutter Leaf	AE
2	99JBFA516137		Lac Gear	AC	9	99JBFA516138		Shutter Spring	AD
3	99JBFA516139		Make Up Ling	AU	10	99JBTP172530		Screw (B)	AA
4	99JBFA516132		Front Panel	AW	11	99JBFA516134		Blade Tap	AG
5	99JBFA516140		Fixation Plate	AD	12	99JBFA516141		Aluminum Sheet (1)	AC
6	99JBTF172525		Screw (B)	AA	13	99JBFA516142		Aluminum Sheet (2)	AC



LENS UNIT PARTS LIST

★ MARK: SPARE PARTS DELIVERY SECTION

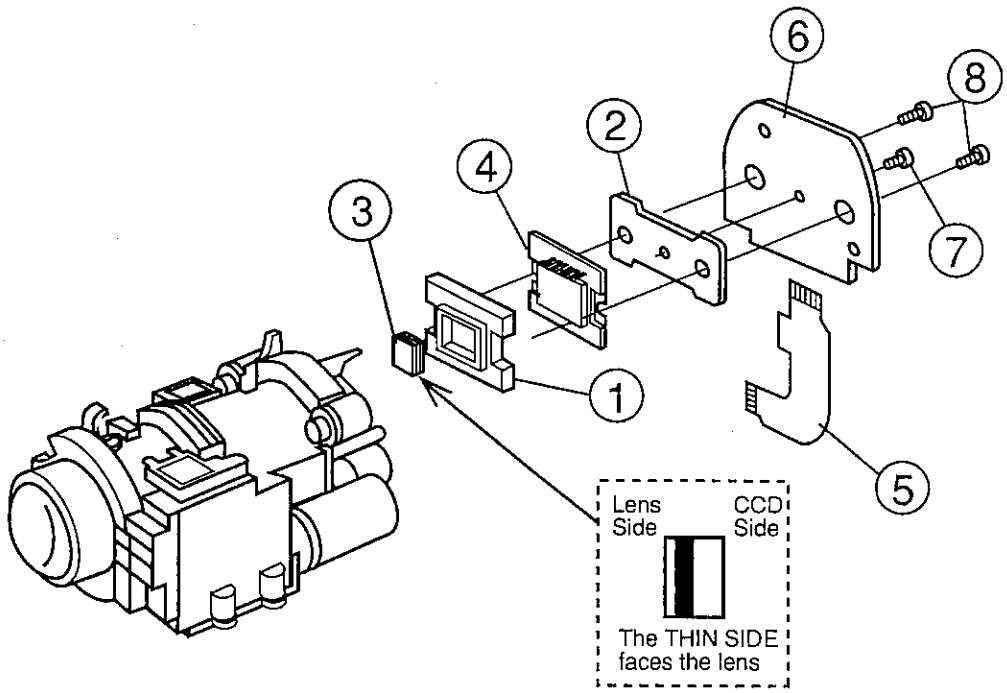
REF.NO.	PART NO.	★	DESCRIPTION	CORD	REF.NO.	PART NO.	★	DESCRIPTION	CORD
	CLNSA0118TA01		Lens Ass'y	BS	A-5	99JBFA516110		Zoom Motor Ass'y	AX
1	99JXSH515815		Anti-Vibration Rubber	AC	6	99JBTH173040		Screw (B)	AA
A-2	99JBFA516115		Zoom Lens Ass'y	BR	A-7	99JBFA516109		Iris Ass'y	AZ
A-3	99JBFA516111		Focus Motor Ass'y	AX	8	99JBTP174030		Screw (B)	AA
4	99JBTP173525		Screw (B)	AA	9	99JBFA516117		Front Group Frame Rubber	AC



CAMERA UNIT PARTS LIST

★ MARK: SPARE PARTS DELIVERY SECTION

REF.NO.	PART NO.	★	DESCRIPTION	CORD	REF.NO.	PART NO.	★	DESCRIPTION	CORD
1	PCOVM8015TA00		Dust Protection Rubber	AB	5	QPWBH2414TAZZ		DSP PWB	AH
2	LANGK0280TAFW		Sensor Holder	AB	6	DUNTK4674KE01		CCD PWB	—
3	PFILW0060TAZZ		Crystal, Optical L.P.F.	AS	7	LX-BZ0176TAFF		Screw, Pan Head(M2 x 2.2)	AA
4	VHiLZ24135/-1		CCD Sensor	BG	8	XEBSD20P06000		Screw, Bind Head(2.0 x 6)	AA



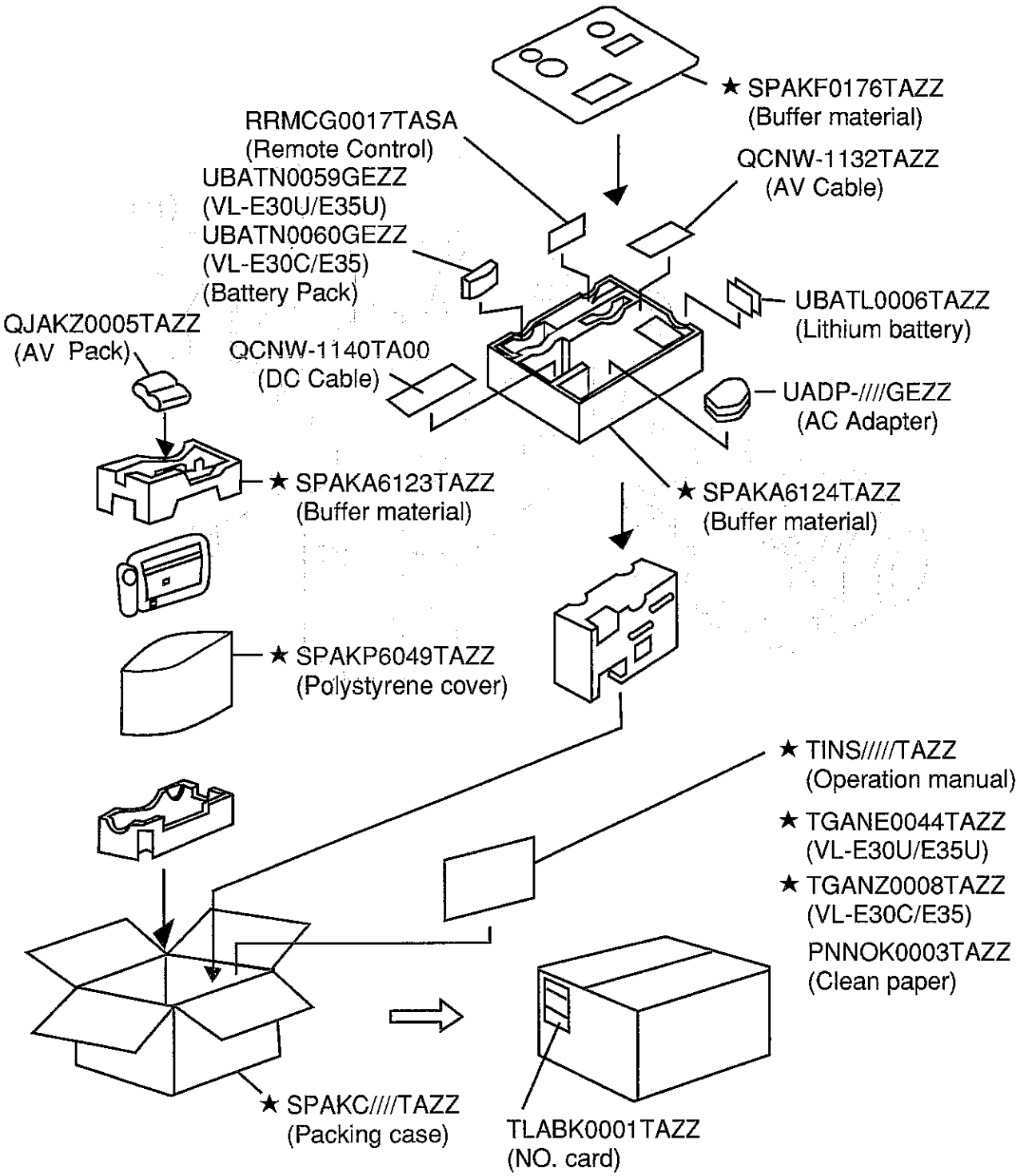
15. PACKING OF THE SET

• **Setting Positions of the switch**

Shutter Select Knob	at "SHUT" Position
Operation Cover	at "SHUT" Position
Power Switch	at "OFF" Position
Shutter	at "SHUT" Position

• **Accessory Part Code List by Models**

Model	AC Adaptor	Operation Manual	Packing Case
VL-E30U	UADP-0156GEZZ	TINSE0142TAZZ	SPAKC6311TAZZ
VL-E30C	UADP-0165GEZZ	TINSE1362TAZZ	SPAKC6312TAZZ
VL-E35	UADP-0165GEZZ	TINSZ1373TAZZ	SPAKC6367TAZZ
VL-E35U	UADP-0156GEZZ	TINSE0149TAZZ	SPAKC6318TAZZ



★ Not Replacement Item

16. AC ADAPTER

UADP-0156GEZZ (VL-E30U/E35U)
UNIT No. UADP-0165GEZZ (VL-E30C/E35)

Features

- Compact and light-weight design for easier portability.
- Automatic voltage change AC 110V to AC 240V allows the adapter usage even in your trips abroad.
- Charging function with battery pack.
- Rapid charging function to enable the charging in a shorter period of time.

Specifications

Power Requirement:	AC 110-240V, 50/60Hz
DC Output:	DC 6.0V
Power Consumption:	23.0W
Dimensions (approx.):	$2\,^{11}/_{16}$" (W) × $1\,^{11}/_{16}$" (H) × $6\,^{7}/_{16}$" (D)
	[70.0 (W) × 43.5 (H) × 163.5 (D) mm]
Weight (approx.):	0.77 lbs (350g)

* Specifications are subject to change without notice.

16-1. PROCEDURES ON SERVICING

● Disassembly

1. Remove the two screws Ⓑ from the bottom of the case Ⓐ.
2. Remove the top case Ⓒ.
3. Take out the shield plates Ⓓ and Ⓔ.
4. Remove the three supporters Ⓗ to take out the heat sinks Ⓕ and Ⓖ.
5. Remove the three supporters Ⓘ to take out the terminal box Ⓘ.

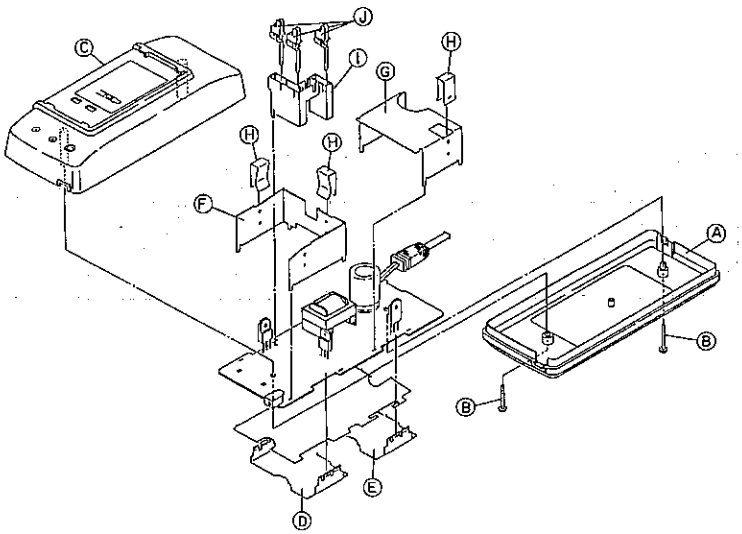


Figure 12-1.

16-2. OPERATION MANUAL

16-2-1. Outline

The AC adapter is designed to be used as the power supply for the camcorder as well as to rapidly recharge its battery.

This unit consists of a separately excited switching regulator which employs control IC and a multi-functional circuit in the secondary side as shown by the block diagram in Fig.16-2-1.

The primary control circuitry and the secondary multi-functional circuitry, composed mainly of surface mounted components, are housed in a small portable casing to cope with various user applications.

The multi-input type adapter accepts the input voltages of 110-240V at 50/60Hz. This handy unit can therefore be carried around and used all over the world.

The basic operation is controlled by two sections. In the power switching section, constant-voltage and constant-current controls are performed by comparing with the reference voltage at the secondary side. The battery charging section, on the other hand, is provided with timers, various detection circuits and sequence controller. As an AC adapter, the unit feeds the EIAJ-rated constant-voltage DC power through its DC jack, and as a battery charger, the unit starts the rapid charging operation when the dedicated Ni-Cd battery is placed in position with the DC plug unconnected.

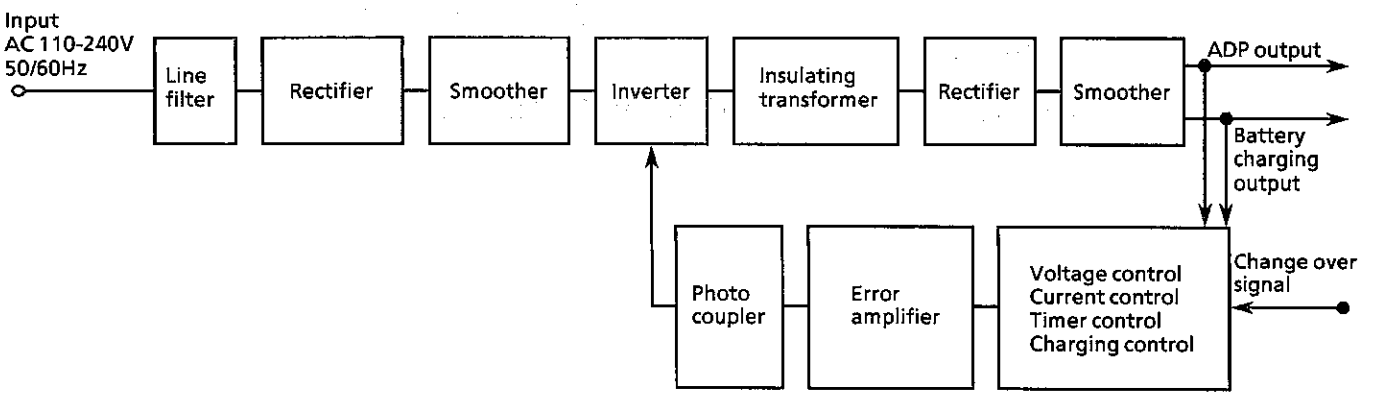


Figure 16-2-1. Block diagram (Camcorder adaptor)

16-2-2. Operation

1. Adapter mode

When the DC plug is attached to the adapter, the constant DC voltage (6.8V, 2.0A) can be obtained via the DC jack to operate the camcorder.

The power consumption can be kept constant over the entire control input range, i.e. regardless of input fluctuations.

The output is available up to 1.5 times the rated current, such as a transient starting current and rush current which would flow in the camcorder.

Also, the adapter output overcurrent protector with fold back current, which controls the power when the short circuit from the outside occurs, is used to prevent the adapter from being destroyed or broken down. It also prevents the temperature inside the adapter from rising too excessively.

2. Ni-Cd charge mode

This adapter, when Ni-Cd battery is attached, can be used as a quick charger. This charging operation is divided into operationing modes of three stages. The adapter goes through these modes sequentially.

Fig.16-2-2 shows the charging characteristics in these three stages.

The first stage is called initial charging. A constant current of 1.2A is charged with a limited voltage of 9.5V for 5 minutes, set by the timer, from point A.

The voltage is thus limited in order to protect the battery against overvoltage and overcharging which would otherwise occur on a fully-charged battery.

The time limit serves to prevent charging error which would take place on a dead battery due to an initial voltage drop.

The second stage is a quick charging mode. Like in the initial charging, a rapid 1.2A charging is made with a limited voltage of 9.5V, but for the timer-controlled charging time of 180 minutes.

Toward the end of this mode, a battery voltage drop ($-\triangle V$ phenomenon at point B) is detected to tell the end of the quick charging, to stop the charging and to go to the next stage.

In this quick 1.2A charging, the 1100mAh battery and the 2400mAh battery are fully charged in about 65 minutes and about 140 minutes, respectively. The timer is set to 180 minutes by which an overcharging possibly due to $-\triangle V$ detection error can be avoided.

The $-\triangle V$ detection level is 80-120mV, in which range noise-caused detection errors are kept off.

In the third stage called trickle charging, auxiliary charging is carried on between points C and D. By so doing, the battery can be fully charged.

The trickle charging is generally set at 1/20-1/30C depending on a battery's characteristics. This adapter adopts a charging system that is controlled by a constant voltage and fixed resistance.

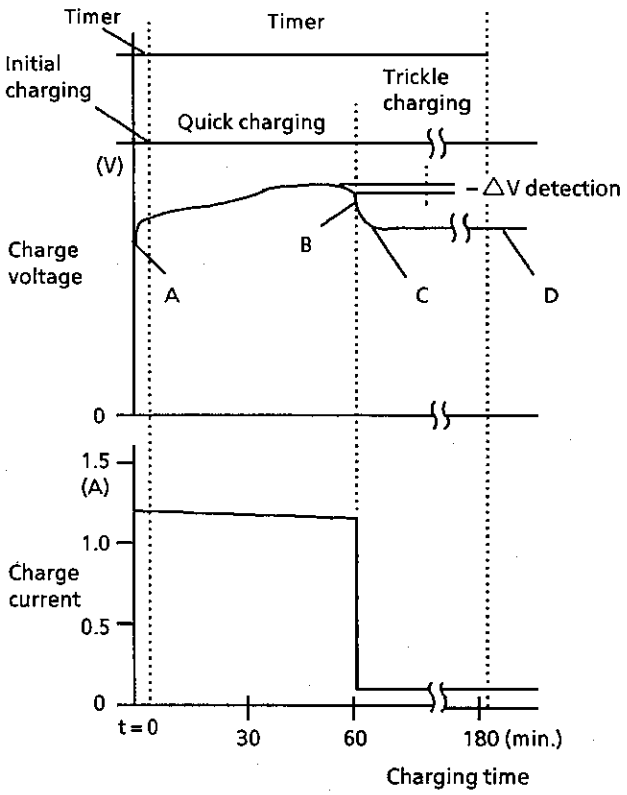


Figure 16-2-2. Charging characteristics with 1100mAh battery

3. Refresh mode

This adapter is prone to a drop in charging efficiency due to their peculiar memory effect. To avoid the drop, this battery may be forcedly discharged using the user switch. Now the battery is ready to get charged anew in the above-mentioned steps.

Push the refresh switch with the battery in place, and a discharge current of 0.3-0.7A flows out and the power is consumed by the resistor inside the adapter.

To minimize its degrading, the battery is discharged down to 5.0V or so, not further down. Then the battery goes into the charging mode.

16-2-3. Circuits

The circuits used for the adapter are explained according to the circuit diagram in page 16-6.

1. Input section
   The input section consists of noise filter and rectification smoothing circuit of condenser input. The noise filter, which consists of L1, C1 and C26, reduces common mode noise.
   R61 is a resistance for discharging electricity retained at input AC plug when the power is turned off.
   The amount of rush current which is caused when the power is turned on is greatly limited by R2, DC resistance of L1 and the operating resistance of D1.

2. Switching section
   The switching circuit, corresponding to the signals sent from the IC for controlling the primary side, makes FET Q1 work as a drive as a switch by using the DC voltage rectified through C2. It, together with the transformer T1, makes up a high-frequency inverter.
   R3 and C3 are surge absorber circuits which absorb the surge voltage generated from the switching of Q1.

3. Primary side control section
   This section drives the switching section by converting the pulse duration of the signal received from the secondary side control circuit through the photo coupler.
   The control IC (IC4) is used to drive Q1 (MOS FET). This IC, operating as an overvoltage protector, contains a circuit which stops oscillating when it detects the overvoltage at D20.

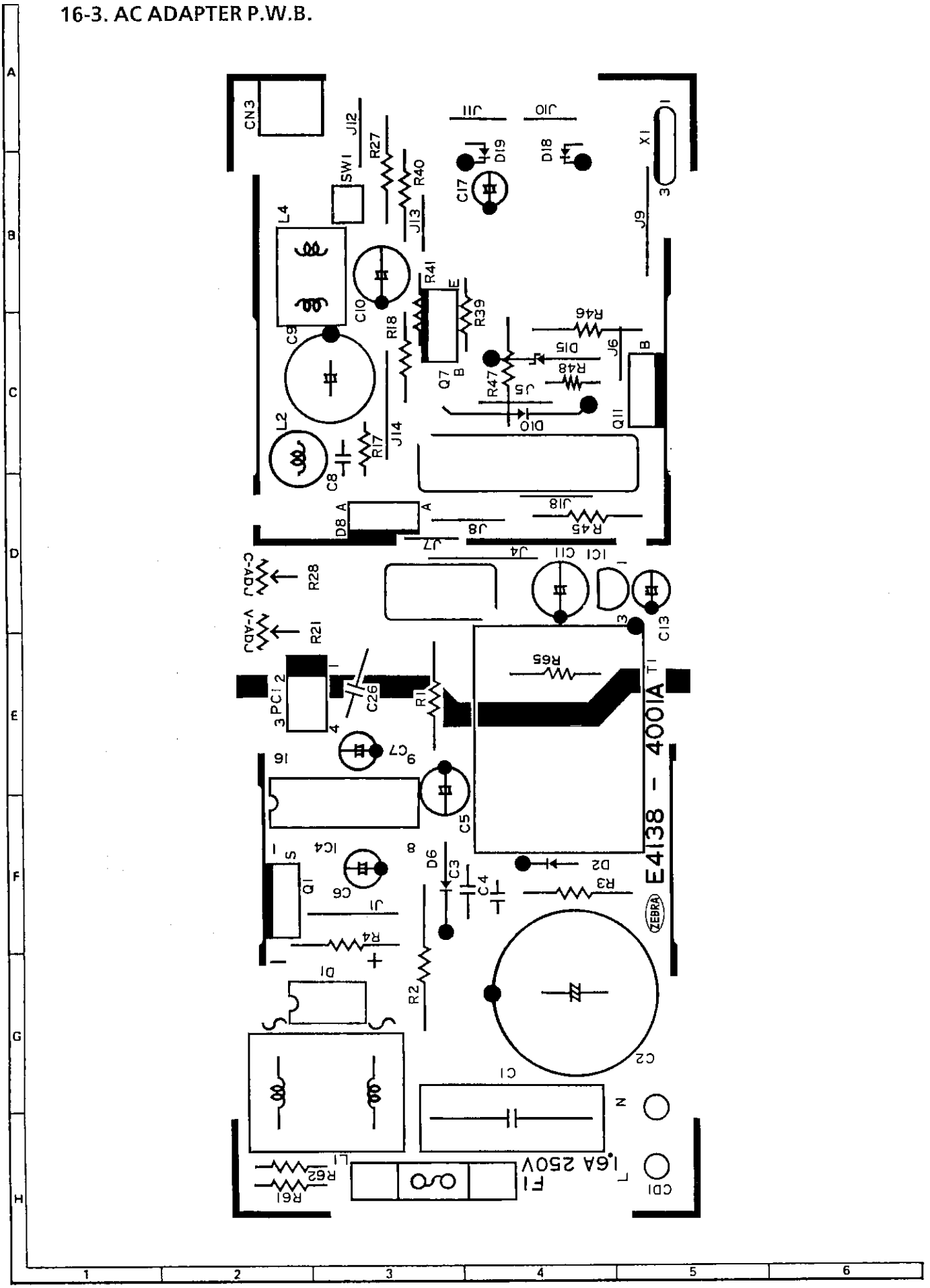
4. Output circuit section
   The secondary side output, which can be controlled by a popular on-off system, reduces output ripples and common mode noise through the choking coils of L2 and L4.
   Q7 is a transistor for the quick / trickle charging selector switch. When Q7 is on, constant-current quick charging is made, and when off, the trickle current flows through R40 and R41.
   D10 is used to prevent discharging trouble to the control circuit section caused when the input is turned off with the battery attached.

5. Battery detection circuit
   The transistor switch in Q7 is kept off without the battery in position. Once the battery has been placed, the impedance of the battery makes current flow out of D11, which turns on Q13 and Q14 to let pin 10 of IC3 detect that the battery is in position and also turns on the transistor switch to let the charging operation start.

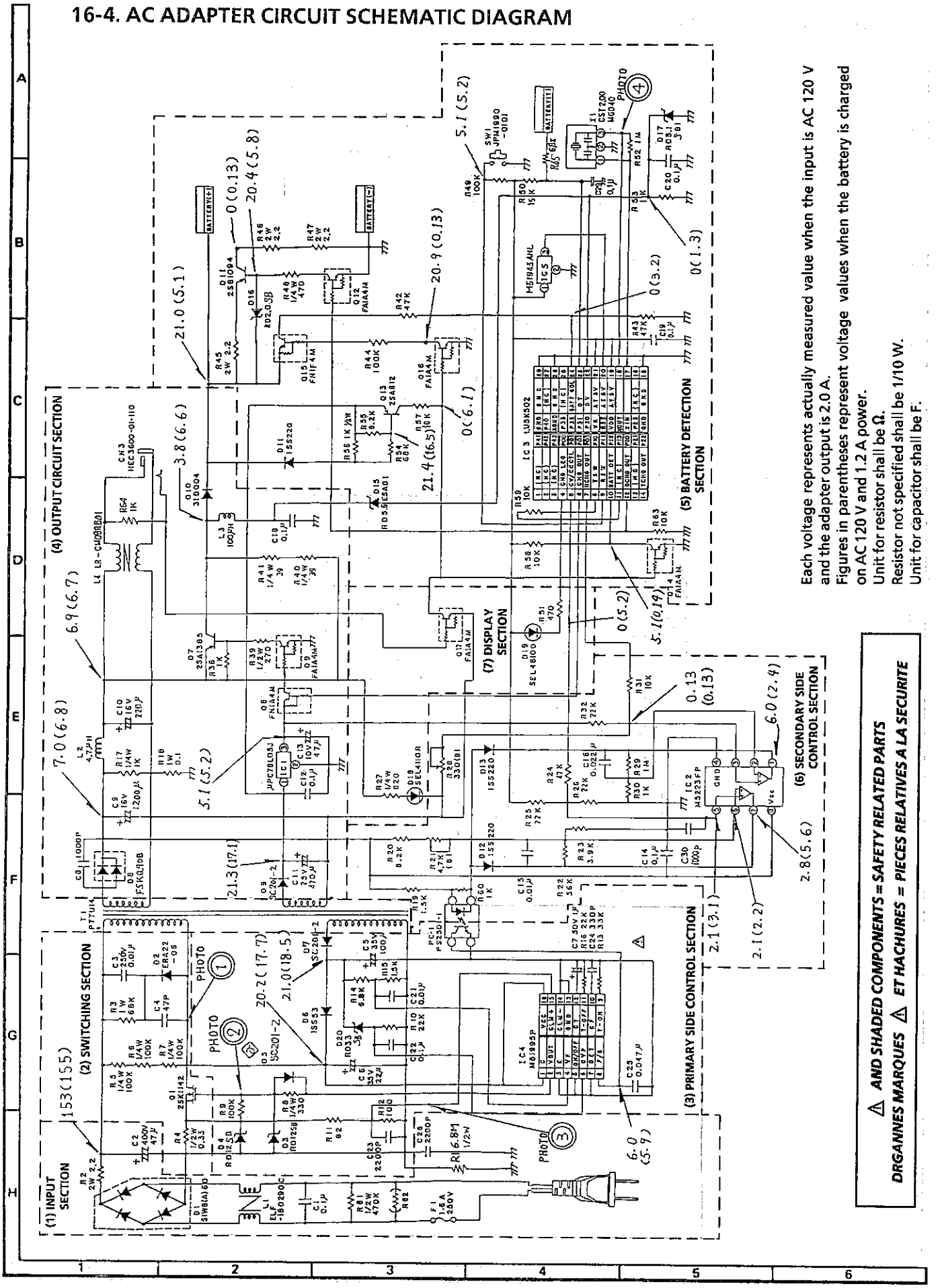
6. Secondary side control section
   The function of the secondary control section is to control the switching section by detecting the output voltage and current and conducting the detected signals to the primary side control circuit through the photo coupler.
   The constant voltage is preset and detected with IC2-II, whereas the adapter (6.8 V)/ charge (10.5 V) mode selection is made by setting pin 5 of IC3 to "H" or "L" to change the reference voltage. The constant current and over-current protector are preset and detected with IC2-I, while 1.2 A/0.4 A constant current selection is made with the seventh output of IC3. The over-current protection in the adapter mode is performed by the primary control circuitry.
   IC1 is used to give the drive power for IC3 and a reference voltage for IC2. Fed into IC2 are the signal of a divided reference voltage as well as that of a divided output voltage and current for comparison.

7. Display
   Only LED (D18) lights up in ADP mode.
   In CHG mode, D18 and D19 light up during rapid charging. When rapid charging is completed (trickle mode), only D19 goes out.
   In refresh mode, D18 stays lit with D19 flashing. The instant the discharging has been completed, the rapid charging starts and D19 stops flashing to stay lit.

16-3. AC ADAPTER P.W.B.

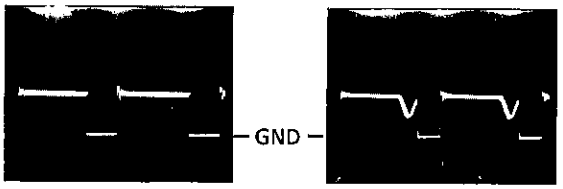


16-4. AC ADAPTER CIRCUIT SCHEMATIC DIAGRAM


(1) INPUT SECTION
(2) SWITCHING SECTION
(3) PRIMARY SIDE CONTROL SECTION
(4) OUTPUT CIRCUIT SECTION
(5) BATTERY DETECTION SECTION
(6) SECONDARY SIDE CONTROL SECTION
(7) DISPLAY SECTION
PHOTO
Each voltage represents actually measured value when the input is AC 120 V and the adapter output is 2.0 A.
Figures in parentheses represent voltage values when the battery is charged on AC 120 V and 1.2 A power.
Unit for resistor shall be Ω.
Resistor not specified shall be 1/10 W.
Unit for capacitor shall be F.
⚠ AND SHADED COMPONENTS = SAFETY RELATED PARTS
DRGANNES MARQUES ⚠ ET HACHURES = PIECES RELATIVES A LA SECURITE

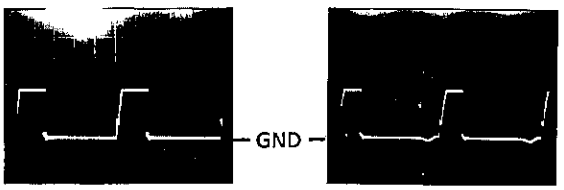
- ADP mode
  Input: AC 120 V
  ADP output : 2.0 A
- CHG mode
  Input AC 120 V:
  Battery CHG: 1.2 A

①



100V, 2µsec/div　　100V, 2µsec/div

②

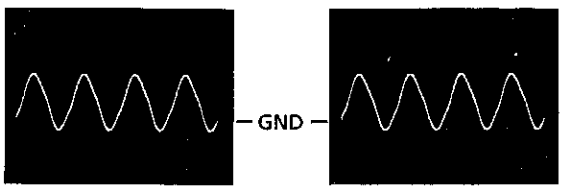


5V, 2µsec/div　　5V, 2µsec/div

③

50mV, 2µsec/div　　50mV, 2µsec/div

④



2V, 0.2µsec/div　　2V, 0.2µsec/div

16-5. REPLACEMENT PARTS LIST/ EXPLODED VIEWS

PARTS REPLACEMENT

Parts marked with " ⚠ " are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

Les pièces marquées " ⚠ " sont importantes pour maintenir la sécurité de l'appareil. Ne remplacer ces pièces que par des pièces dont le numéro est spécifié pour maintenir la sécurité et protéger le bon fonctinnement de l'appareil.

"HOW TO ORDER REPLACEMENT PARTS"

in USA: Contact your nearest SHARP Parts Distributor. For location of SHARP Parts Distributor, Call Toll-free 800-447-4700

in CANADA: Contact SHARP Electronics of Canada Limited Phone (416) 890-2100

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER **2. REF. NO.**
3. PART NO. **4. DESCRIPTION**
5. PRICE CODE

⚠MARK: SAFETY RELATED PARTS
⚠PIECES: RELATIVES A LA SECURITE

PWB ASSEMBLY IS NOT REPLACEMENT ITEM
L'ASSEMBLANGE P.C.I. EST UN ARTICLE NON REMPLAÇABLE

Ref. No.	Part No.	Description	Code
INTEGRATED CIRCUITS			
IC1	95KUCB0068AK	UPC78L05AF	AF
IC2	95KUCY0011AK	M5223FP	AE
IC3	95KUCY0012AK	LU5K502	AQ
⚠IC4	95KUCC0044AZ	M51995P	AP
IC5	95KUCY0013AK	M51943AML	AF
TRANSISTORS			
⚠Q1	95KUAG0048AZ	2SK1142	AM
Q7	95KUAA0086BZ	2SA1385	AG
Q8	95KUAY0001AK	FN1A4M	AC
Q9, 12, 14, 16, 17	95KUAY0002AK	FA1A4M	AC
Q11	95KUAB0019BZ	2SB1094	AG
Q13	95KUAY0012AK	2SA812	AB
Q15	95KUAY0011AK	FN1F4M	AC

DIODES

Ref. No.	Part No.	Description	Code
⚠D1	95KUBB0148DZ	S1WB(A)60	AF
⚠D2	95KUBC0169CK	ERA22-06	AC
⚠D3, ⚠4	95KUBXAD120C	RD12SB	AC
⚠D5, 11, 12 13	95KUBY0007AK	1SS220	AC
⚠D6	95KUBA0004KZ	1SS53-T4	AB
⚠D7, 9	95KUBY0015AK	SC201-2	AD
	or		
	95KUBY0009AK	EC11FS2	AD
D8	95KUBC0167ET	F5KQ90B	AH
	or		
	95KUBB0168FZ	F10P10Q	AK
D10	95KUBC0095BB	31DQ04FC	AE
D15	95KUBDAK5R6B	RD5.6ESAB1	AB
D16	95KUBXAD2R0A	RD2.0SB-T1	AC
D17	95KUBXAD5R1B	RD5.1SB1	AC
D18	95KUDC0137ZZ	SEL4110R	AC
D19	95KUDC0138ZZ	SEL4810D	AC
⚠D20	95KUBXAD330A	RD33SB	AC

COILS AND TRANSFORMER

⚠L1	95KUKZ0306ZZ	Choke	AK
L2	95KUKZ0496ZK	4.7µH, Filter	AE
L3	95KUKY0001AK	100µH	AE
L4	95KUKZ0497ZZ	Choke	AH
⚠T1	95K129035028	PTTU14, Power Transformer	AX
X1	95KUZZ0128ZZ	Crystal	AF

CONTROLS

R21	95KUFBA472CY	4.7k(B)	AC
R28	95KUFBA331DB	330(B)	AC

CAPACITORS

⚠C1	95KUGFZ104GA	0.1µF, 250V, ±20%, Film	AF
⚠C2	95KUGZ0831ZZ	47µF, 400V, ±20%, Electrolytic	AK
⚠C3	95KUGFM103FB	0.01µF, 250V, ±10%,	AC
	or	Film	
	95KUGFQ103FB		AC
⚠C4	95KUGCU470BG	47pF, 1kV, ±10%, Ceramic	AB
⚠C5	95KUGAE101JG	100µF, 35V, ±20%, Film	AC
	or		
	95KUGAE101HN		AC
⚠C6	95KUGAE220FD	22µF, 35V, ±20%,	AB
	or	Electrolytic	
	95KUGAE220HN		AB
⚠C7	95KUGAF010FD	1µF, 50V, ±20%,	AB
	or	Electrolytic	
	95KUGAF010HN		AB
C8	95KUGCZ102BQ	1000pF, 500V, +100%~ −0%, Ceramic	AB
C9	95KUGAC122NS	1200µF, 16V, ±20%, Electrolytic	AE
C10	95KUGAC221FD	220µF, 16V, ±20%,	AC
	or	Electrolytic	
	95KUGAC221HN		AC
C11	95KUGZ0832ZZ	470µF, 25V, ±20%, Electrolytic	AD
C12, 14, 18, 19, 20, ⚠22, 29	95KUGXAFF104	0.1µF, 50V, +80%~ −20%, Ceramic	AB
C13	95KUGAB470FD	47µF, 10V, ±20%,	AB
	or	Electrolytic	
	95KUGAB470HN		AB
C15, ⚠21	95KUGXAEF103	0.01µF, 50V, ±10%, Ceramic	AB
C16	95KUGXAEF223	0.022µF, 50V, ±10%, Ceramic	AB
⚠C23	95KUGXAEF222	2200pF, 50V, ±10%, Ceramic	AA
⚠C24	95KUGXAEF331	330pF, 50V, ±10%, Ceramic	AA
⚠C25	95KUGXAFF473	0.047µF, 50V, +80%~ −20%, Ceramic	AB
⚠C26	95KUGCQ222AR	2200pF, 250V, ±20%, Ceramic (VL-E30U/E35U)	AC
⚠C26	95KUGCZ222CD	2200pF, 250V, ±20%, Ceramic (VL-E30C/E35)	AC
C30	95KUGXAEF102	1000pF, 50V, ±10%, Ceramic	AA

RESISTORS

⚠R1	95KUEZ0437ZK	6.8M ohm, 1/2W, ±10%, Solid	AB
⚠R2	95KUEAE2R2AF	2.2 ohm, 2W, ±5%, Metal	AE
⚠R3	95KUEFD683BH	68k ohm, 1W, ±5%, Metal Film	AB
⚠R4	95KUEFCR33AW	0.33 ohm, 1/2W, ±10%, Metal Film	AA
⚠R5, ⚠6, ⚠7	95KUEXJAA104	100k ohm, 1/4W, ±5%, Carbon	AA

Ref. No.	Part No.	Description	Code
⚠R8	95KUEXJAA331	330 ohm, 1/4W, ±5%, Carbon	AA
⚠R9, 44, 49	95KUEXCAC104 or 95KUEXCAA104	100k ohm, 1/10W, ±5%, Carbon	AA AA
⚠R10, ⚠ 16, 25, 26, 32	95KUEXCAC223 or 95KUEXCAA223	22k ohm, 1/10W, ±5%, Carbon	AA AA
⚠R11	95KUEXCAC820	82 ohm, 1/10W, ±5%, Carbon	AA
⚠R12	95KUEXCAC101 or 95KUEXCAA101	100 ohm, 1/10W, ±5%, Carbon	AA AA
⚠R13	95KUEXCAC333 or 95KUEXCAA333	33k ohm, 1/10W, ±5%, Carbon	AA AA
⚠R14	95KUEXCAC682 or 95KUEXCAA682	6.8k ohm, 1/10W, ±5%, Carbon	AA AA
⚠R15, 19	95KUEXCAC152 or 95KUEXCAA152	1.5k ohm, 1/10W, ±5%, Carbon	AA AA
R17	95KUEEB102BE or 95KUEEB102BF	1k ohm, 1/4W, ±5%, Carbon	AA AA
R18	95KUEFDR10BE	0.1 ohm, 1W, ±10%, Metal Film	AD
R20	95KUEXCAC822 or 95KUEXCAA822	8.2k ohm, 1/10W, ±5%, Carbon	AA AA
R22	95KUEXCAC563 or 95KUEXCAA563	56k ohm, 1/10W, ±5%, Carbon	AA AA
R23	95KUEXCAC392	3.9k ohm, 1/10W, ±5%, Carbon	AA
R24, 42, 43	95KUEXCAC473	47k ohm, 1/10W, ±5%, Carbon	AA
R27	95KUEEB821BE or 95KUEEB821BF	820 ohm, 1/4W, ±5%, Carbon	AA AA
R29, 52	95KUEXCAC105 or 95KUEXCAA105	1M ohm, 1/10W, ±5%, Carbon	AA AA
R30, 38, 53, 60, 64	95KUEXCAC102 or 95KUEXCAA102	1k ohm, 1/10W, ±5%, Carbon	AA AA
R31, 57, 58, 59, 63	95KUEXCAC103 or 95KUEXCAA103	10k ohm, 1/10W, ±5%, Carbon	AA AA
R39	95KUEEC271BE or 95KUEEC271AT	270 ohm, 1/2W, ±5%, Carbon	AA AA
R40, 41	95KUEEB390BE or 95KUEEB390BF	39 ohm, 1/4W, ±5%, Carbon	AA AA
R45, 46, 47	95KUEFE2R2BJ	2.2 ohm, 2W, ±5%, Metal Film	AC
R48	95KUEEB471BE or 95KUEEB471BF	470 ohm, 1/4W, ±5%, Carbon	AA AA
R50	95KUEXCAC153 or 95KUEXCAA153	15k ohm, 1/10W, ±5%, Carbon	AA AA
R51	95KUEXCAC471 or 95KUEXCAA471	470 ohm, 1/10W, ±5%, Carbon	AA AA
R54	95KUEXCAC683 or 95KUEXCAA683	68k ohm, 1/10W, ±5%, Carbon	AA AA
R55	95KUEXCAC822 or 95KUEXCAA822	8.2k ohm, 1/10W, ±5%, Carbon	AA AA
R56	95KUEXJAA102	1k ohm, 1/4W, ±5%, Carbon	AB
⚠R61	95KUEEC474BE or 95KUEEC474AT	470k ohm, 1/2W, ±5%, Carbon	AA AA
R65	95KUEEB682BE or 95KUEEB682BF	6.8k ohm, 1/4W, ±5%, Carbon	AA AA

MISCELLANEOUS

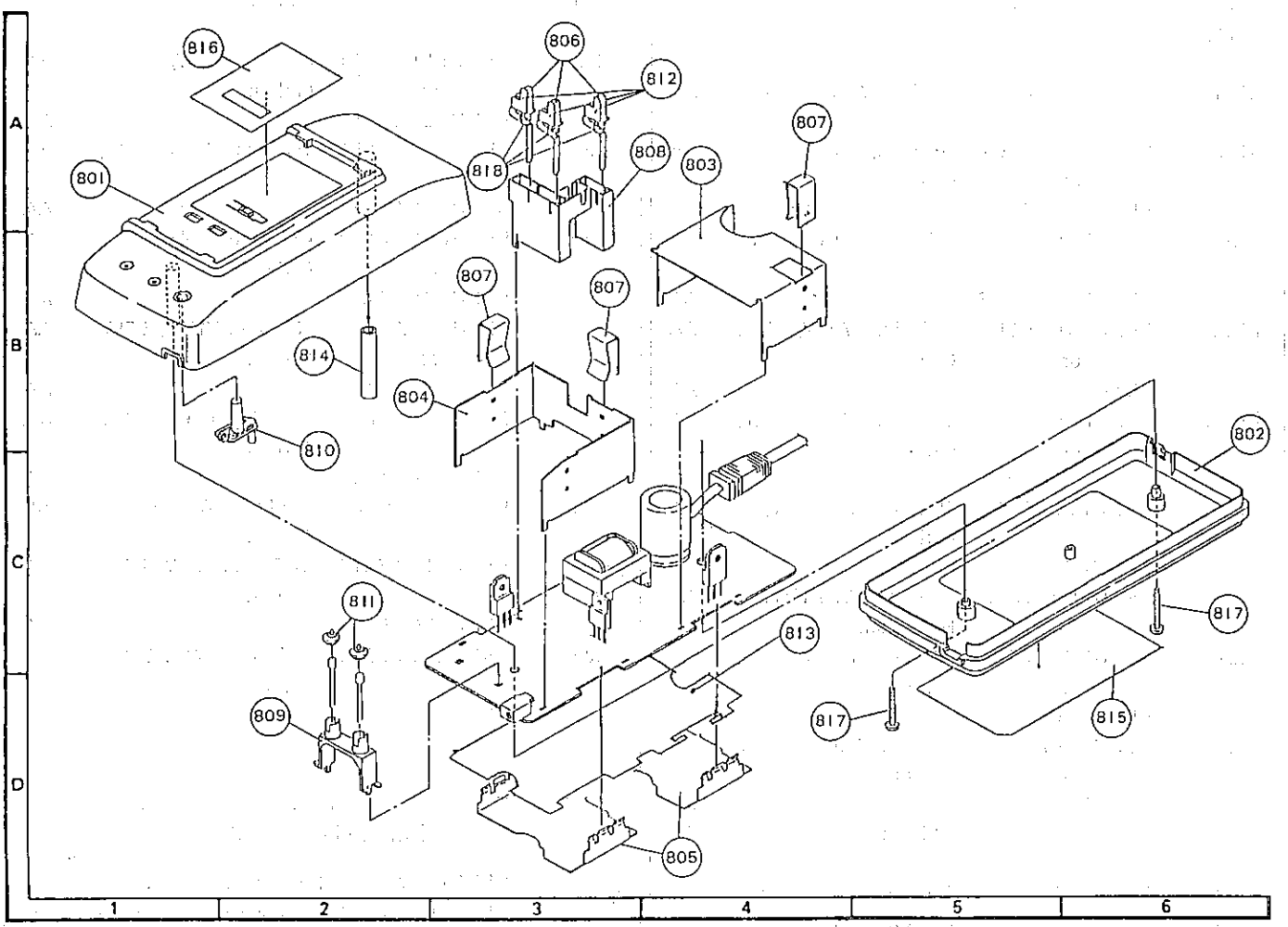
⚠F1	95KPJCAK1601	Fuse, 1.6A, 250V (VL-E30U/E35U)	AG
⚠F1	95KPJCAJ1601	Fuse, 1.6A, 250V (VL-E30C/E35)	AG
⚠PC1	95KUDC0062AZ	Photo Coupler, PS2501-1	AE
⚠	95KEHS0624ZZ	AC Cord	AM
CN3	95KPGZ0024ZZ	Connector, Jack	AE
SW1	95KPFZ0219ZZ	Switch, Refresh	AC

CABINET PARTS

801	95KMRZ5227ZZ	Cabinet, Upper	AM
802	95KMRZ5228ZZ	Cabinet, Lower	AL
803	95KLRZ5893ZP	Sink, Heat	AE
804	95KLRZ5894ZP	Sink, Heat	AE
805	95KLRZ5892ZZ	Plate, Shield	AD
806	95KFBZ0112ZZ	Terminal	AC
807	95KLRS5015ZZ	Supporter	AC
808	95KMRZ5235ZZ	Terminal Box	AF
809	95KMRZ5221ZZ	Holder, LED	AE

Ref. No.	Part No.	Description	Code
810	95KMRZ5224ZZ	Switch, Refresh	AD
811	95KMRZ5222ZZ	Lens, LED	AC
812	95KMRZ5236ZZ	Supporter	AC
813	95KGZZ5108ZZ	Sheet, Insulator	AC
814	95KMRZ5232ZZ	Boss	AC
815	95KSBB1582ZZ	Label, Model (VL-E30U/E35U)	AD

Ref. No.	Part No.	Description	Code
815	95KSBB1608ZZ	Label, Model (VL-E30C/E35)	AD
816	95KSBB1577ZZ	Label	AD
817	95KRAZF002ZE	P Tight Screw, Pan Head (2.6×20)	AA
818	95KLRZ5912ZZ	Spring	AA



VL-E30U/C
VL-E35U/E35

SHARP

Printed in Japan